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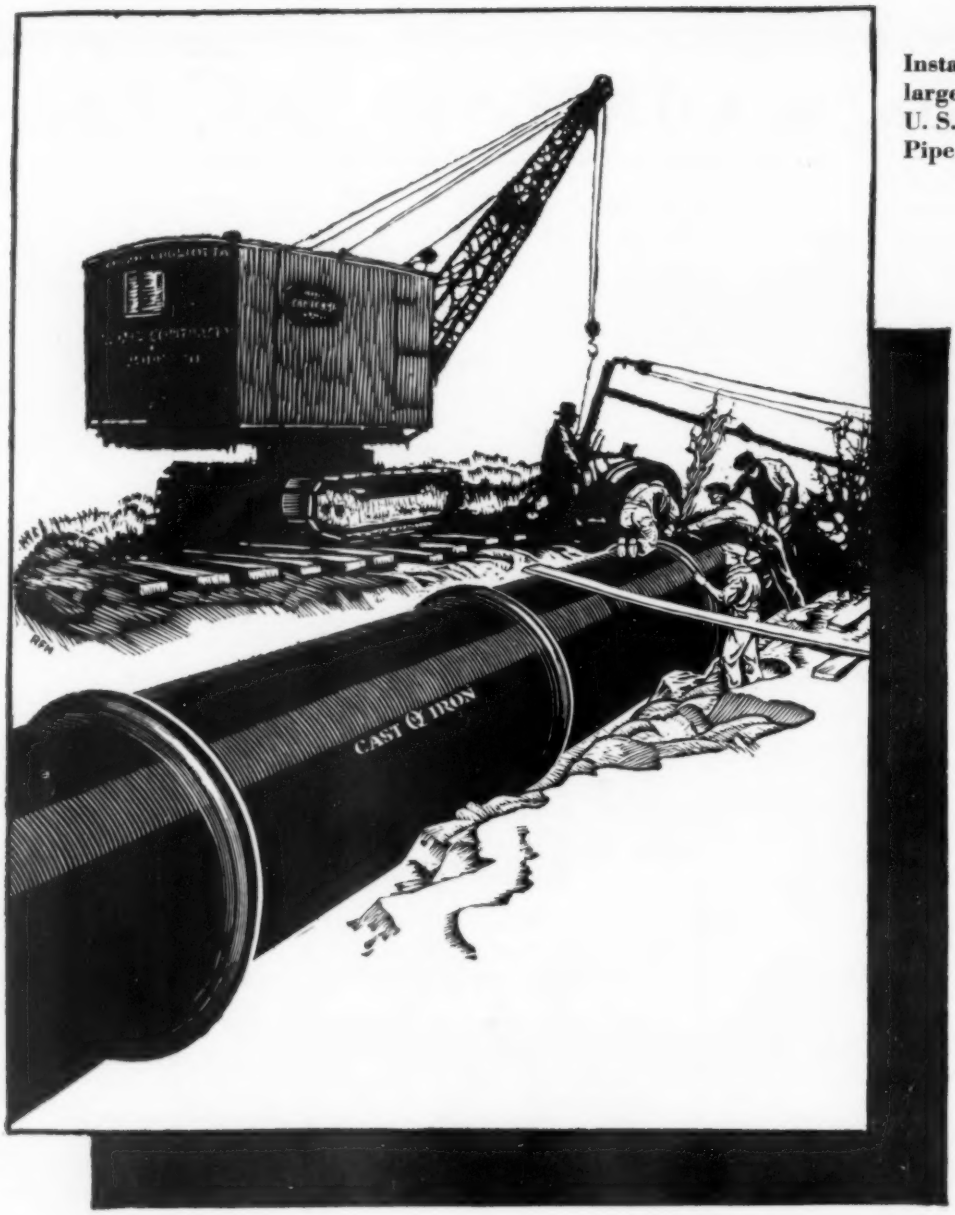
In THE MUNICIPAL INDEX (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find much material, including lists, and articles on a wide variety of municipal and civic subjects, not published in the monthly issues of the magazine.

See pages 21, 22, 79, 81, 83, for notices of catalogs and publications on municipal and civic subjects

For Index to Advertisements see page 118



Installation of large diameter U. S. Cast Iron Pipe at Atlantic City

Our pipe bears this trademark of The Cast Iron Pipe Research Association.

Large scale production of large diameter pipe requires extensive and resourceful plant facilities. The number and location of our various plants plus exceptional production and shipment facilities offer definite advantages to pipe buyers. Illustration above shows installation of 9600 feet of 60-inch U. S. Cast Iron Pipe for Atlantic City's main supply line. We have prepared a book—"Along Large Cast Iron Lines"—illustrating and describing interesting installations. Gladly sent upon request.

UNITED STATES PIPE AND FOUNDRY COMPANY, BURLINGTON, N. J.
SALES OFFICES: NEW YORK, BUFFALO, CLEVELAND, CHICAGO, PHILADELPHIA, PITTSBURGH, DALLAS, BIRMINGHAM, KANSAS CITY, MINNEAPOLIS, SEATTLE, LOS ANGELES, SAN FRANCISCO

U. S. CAST IRON PIPE

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A Unique Opportunity for Public Works Planning

"AMERICA is strongly disposed to hysteria, and the present public attitude in regard to public spending is just as unreasoning and unwarranted as our mania for speculation in 1929. Many communities which possess excellent credit are losing the opportunity of a generation to make public improvements, particularly those involving acquisition of land, at low cost. It is probable that the hysterical attitude toward public spending is adding at least 400,000 to the unemployed this spring and summer. The more indirect effects on general business and unemployment are difficult to estimate, but they are serious. It would not be surprising if the total effect of direct and indirect curtailment in public spending is an increase of a million in the unemployed.

"It is, of course, true that the long-continued depression has made plain many grave weaknesses in our system of taxation and our fiscal policies. Particularly, it has shown the imperative necessity of long-range planning of public works. If cities and other governmental bodies were to operate on the basis of a five-year program, much of the opposition to expanding public construction during the depression would be destroyed. It would be possible, for example, to expand the 1932 construction program simply by moving ahead part of the 1933 or 1934 program into 1932. Taxpayers would then have more or less definite assurance that expansion in public construction would mean no ultimate increase in expenditures and no ultimate increase in taxes."

These are the words, not of a radical agitator, but of Sumner H. Slichter, Professor of Business Economics of Harvard University, in a letter written June 9, 1932, to THE AMERICAN CITY. Professor Slichter's advice is addressed primarily to the municipalities—of which there are thousands throughout the United States—which can borrow money at reasonable rates. To others not so fortunately situated, it seems quite certain, as this issue goes to press, that Federal funds will be made available—to quote President Hoover's statement of June 24—by extending "the authority of the Reconstruction Finance Corporation to use its credit to make advances on adequate security up to $1,500,000,000 for construction work of the type which will pay for itself, and for which plans are immediately ready and therefore can begin the employment of men."

As will be noted, the President's words suggest the urgency of the prompt preparation or completion of plans for needed public works. If your city forces are inadequate for such immediate action, now if ever is the time to secure engineering advice from competent consultants, and to enlist to the utmost the cooperation of local and regional planning bodies.

How Much Does Government Cost the Average Citizen?

NOBODY knows the exact answer to this question; but perhaps the most authoritative approximate answer is to be found in the new volume of the National Industrial Conference Board's publications, "Cost of Government in the United States, 1929-1930."* This estimates the tax collections of all governmental divisions in 1930 at $10,266,000,000, divided as follows:

	Amount	Per Capita
Federal	$3,468,000,000	$28.15
State	1,780,000,000	14.45
Local	5,018,000,000	40.73
Total	$10,266,000,000	$83.33

The same volume estimates the combined gross expenditures of the Federal, state and local governments of the United States in 1929 at $13,048,000,000. This figure, however, is much in excess of the actual cost of government to the taxpayers, since the "gross expenditures" include new bond issues, retirement of the public debt, and many expenditures for public utilities and other services partially or wholly paid for out of revenues from such services.

The fluctuation of per capita taxes for local, state and Federal purposes since 1921 are shown in the accompanying graph, reproduced from a portion of Chart 10 of the above-mentioned book.

The principal sources of taxes for the latest year for which a detailed estimate has been made by the National Industrial Conference Board were as follows:

LOCAL TAXES—(1930)

Property taxes	$4,614,153,000
Other taxes	171,115,000
Licenses and permits	232,520,000
Total	$5,017,788,000

STATE TAXES—(1929)

General property taxes	$350,233,237
Poll taxes	3,542,204
Special property taxes	108,850,590
Inheritance taxes	148,591,827
Income taxes	74,595,414
Other special taxes	69,175,835
Gasoline taxes	282,578,977
Motor-vehicle licenses	287,070,266
Business licenses	272,870,807
Non-business licenses and permits	14,451,963
Total	$1,611,961,120

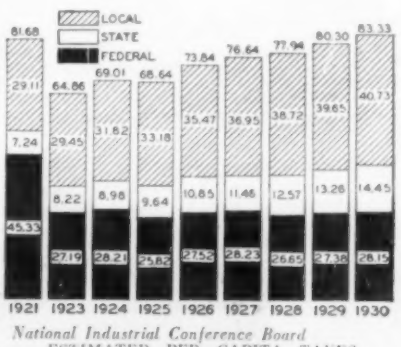
FEDERAL TAXES—(1930)

Corporation income tax	$1,263,414,000
Personal income tax	1,146,845,000
Estate tax	64,770,000
Corporation capital stock tax	47,000
Sumptuary excises	2,320,000
Automobile and motorcycle excises	2,320,000
Other excises	94,825,000
Miscellaneous internal revenue	1,371,000
Customs receipts	593,838,000
Total	*$3,633,983,000

* The excess of this figure over the total of $3,468,000,000 of Federal taxes listed in the first table is due to the fact that the last table shows total tax revenues without deduction of refunds.

As indicated by the first table and the graph, a fair answer to the question at the head of this article would appear to be that it costs the average American citizen about $40.73 per annum for the services of local government (city, county, school district, etc.); about $14.45 for the services of his state government; and $28.15 for operation of the Federal Government. Of the last mentioned, it is worth noting that only 10 per cent is attributable to general government costs, 2.1 per cent to highways, 5.5 per cent to economic development, 2.5 per cent to education and social welfare, 3.2 per cent to public utilities, 3.6 per cent to miscellaneous; while practically all of the remaining 73.1 per cent represents the cost of past and future wars (protection, 39 per cent; debt redemption, 18.1 per cent; interest, 16 per cent).

For the most recent analysis of local government expenditures for cities of over 30,000 population, the reader is referred to the Census Bureau's tabulation of "Financial Statistics of Cities: 1930," in the 1932 Municipal Index, page 144.



National Industrial Conference Board
ESTIMATED PER CAPITA TAXES, FISCAL YEARS 1921-1930

* See department of Municipal and Civic Publications in this issue.

"Tank has been very satisfactory—would dislike very much to go back to the old way"

While we build many tanks that are noteworthy because of their size, design or operating conditions, the majority are standard structures. You no doubt are interested in what we do with the typical cases as well as with the spectacular ones.

Mr. J. B. Farmer, Supt. of the Water Department of Murfreesboro, Tenn., recently wrote us a letter which is so typical of the way the average user of a Horton tank feels a year after the tank is completed, that we want you to read this letter rather than any statement of ours. Here it is:

"In regard to the tank erected for us, will say that it has been very satisfactory in every respect. We would dislike very much to go back to the old way of pumping direct. We are saving about 25% over direct pumping in fuel cost, due to the fact that we are able to bank the fires and let the tank do the work that formerly kept us running 24 hours per day.

"We let the tank 'float' on the distribution system at all times. Tank is equipped with a valve that automatically controls water level in tank. We had two pumpers in service at one time during a fire a few weeks ago, and needless to say that fire was stopped in the building in which it originated. We find we have fewer leaks in mains and house services due to a more uniform pressure.

"If you remember, this is a 500,000-gallon tank and is 100 feet from the ground level to bottom of tank.

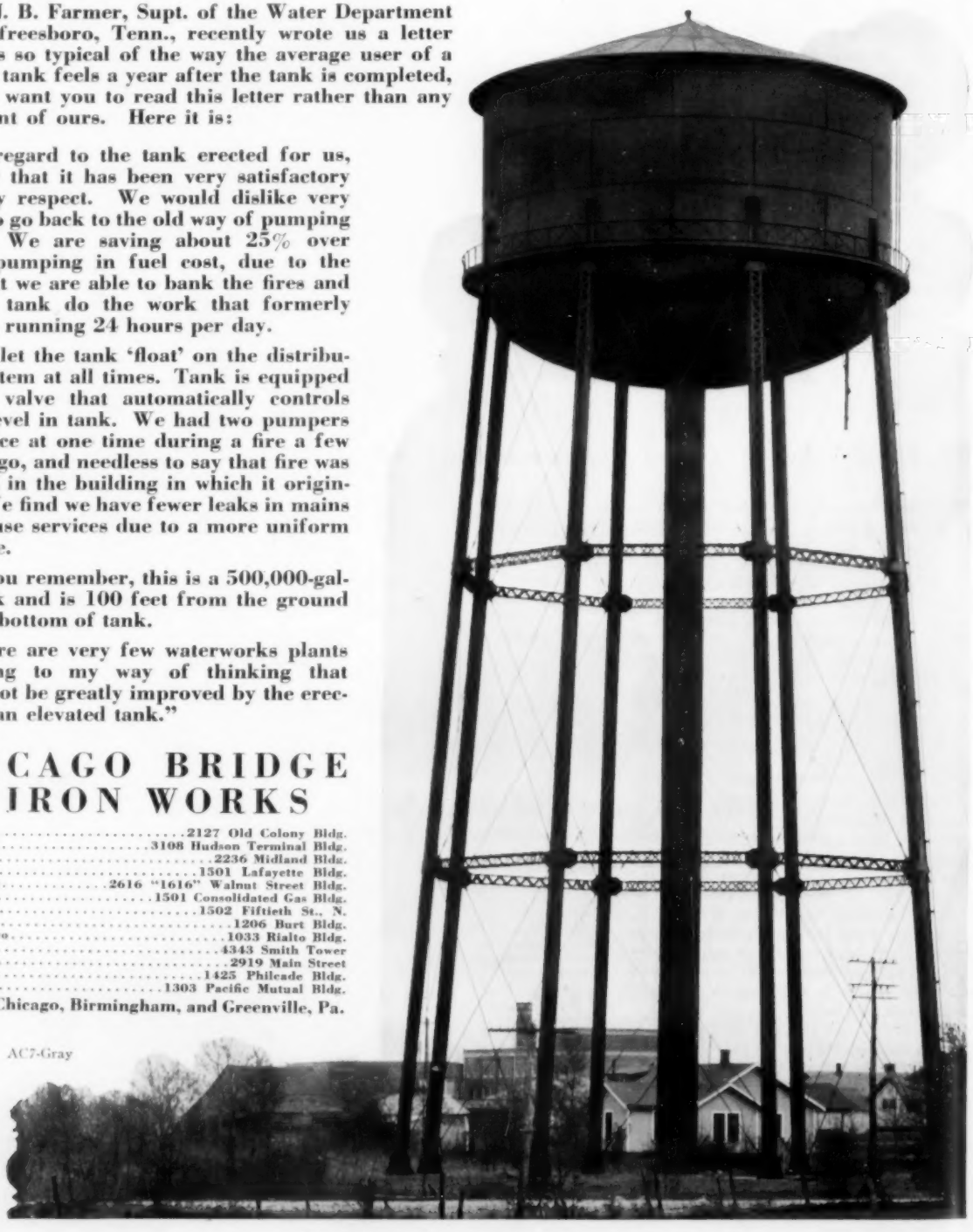
"There are very few waterworks plants according to my way of thinking that would not be greatly improved by the erection of an elevated tank."

CHICAGO BRIDGE & IRON WORKS

Chicago.....2127 Old Colony Bldg.
New York.....3108 Hudson Terminal Bldg.
Cleveland.....2236 Midland Bldg.
Detroit.....1501 Lafayette Bldg.
Philadelphia.....2616 "1616" Walnut Street Bldg.
Boston.....1501 Consolidated Gas Bldg.
Birmingham.....1502 Fiftieth St., N.
Dallas.....1206 Burt Bldg.
San Francisco.....1033 Rialto Bldg.
Seattle.....4343 Smith Tower
Houston.....2919 Main Street
Tulsa.....1425 Philcade Bldg.
Los Angeles.....1303 Pacific Mutual Bldg.

Plants in Chicago, Birmingham, and Greenville, Pa.

AC7-Gray



Pure Water—Man's Greatest Need

The Lingo of the Chemist

The Chemist at a water plant
  Is a funny guy, by jingo—
Has a crazy way of talking
  In a strange and private lingo.

Water isn't water—
  That's the first thing you must know.
When the Chemist speaks of water,
  He will call it H_2O.

He gets a colored water
  And goes almost crazy—See!
As he hollers to his strikers,
  "Start the $FeCl_3$!

"Get the NH_3 a-going.
  Now, then, get a move on you
And add more $CaCO_3$.
  Jack up the Cl_2.

"What? You haven't any NH_3!
  You bloomin' nuts—I've said before
I hate to use the substitute,
  The $(NH_4)_2SO_4$.

"What!—the pH is declining?
  There is iron that you can see?
Well, you blighter, you get busy,
  Add Na_2CO_3.

"There's the telephone a-ringing.
  Gosh! but we are in a fix.
Super' says the water's lousey
  And is filled with Crenothrix.

"Never saw the like before.
  I will sure catch hell.
Come, you guys, do something
  With the NH_4Cl."

I'd like to change that crazy talk—
  But then I'm not a meddler.
Still I'm glad I'm not a Chemist,
  But am just a blooming peddler!

—Read by William J. Orchard, of Wallace & Tiernan, at the A. W. W. A. Water Purification Section dinner.

Filtration versus Chlorination

THE degree of treatment necessary in order to assure that water of satisfactory physical, chemical and bacterial quality will be produced, depends upon local conditions, and, therefore, few general statements can be made regarding the subject. It is obvious, however, that when well waters are moderately polluted but clear, it is possible to produce water of satisfactory quality by the use of chlorination alone. This does not imply that grossly polluted wells should be used as sources of water supply even if chlorination is practiced, because too much dependence should not be placed on the effectiveness of chlorination where failure of the apparatus to operate would result in the delivery of water of an unsafe sanitary quality. Chlorination equipment is subject to interruption and breakdown, and too much dependence certainly should not be placed on the equipment to provide continuous treatment.

The exposure of surface waters to incidental and accidental pollution at all times, as well as constant pollution in many cases, necessitates the treatment of such waters before they can be safely used for water-supply purposes. Relatively clear lakes and upland streams may not require filtration; nevertheless, such waters should be chlorinated before being delivered to the consumers, even though bacteriological analyses and sanitary surveys indicate that the waters are not polluted to any great extent at the time the surveys are made. Chlorination in such cases is a reasonable safeguard against the delivery of water of an unsatisfactory sanitary quality.

If disinfection of a surface water is essential at all times to remove intestinal organisms known to be continuously present, and when surface waters are turbid or colored, the water should be filtered before being chlorinated, so that dependence will not have to be placed upon chlorination alone in order to produce water of satisfactory quality and attractive appearance. In other words, filtration should be used in these cases as the fundamental process, and chlorination should be used as a factor of safety or a supplement to the main process. This is essentially the recommendation of the Division of Sanitation, New York State Department of Health, as published in its booklet, "The Protection and Chlorination of Public Water Supplies."

Concrete Lining for Large Distributing Reservoir

WESTCOTT RESERVOIR, Syracuse, N. Y., is located approximately 1 mile north of the present conduit line and about 1½ miles west of one of the main feeders from Woodland Reservoir to the center of consumption of the city. The elevation and size of the hill were such that a reservoir of the same elevation and depth as Woodland and of approximately the same capacity could be economically constructed, the capacity being about 105,000,000 gallons. The geological formation of this hill is commonly known as a drumlin, having been deposited by glacial action. Preliminary borings indicated the soil to be mostly hard clay with a mixture of gravel.

According to plans, the central portion of the hill was excavated and an embankment formed around the perimeter of the hill with the material excavated, to such lines and grades that approximately one half of the embankment is natural ground and the other half artificial.

For the convenience of the contractor a gap was left in the northwest corner of the embankment until the completion of the job, to provide entrance to the basin. In order that the compaction in this gap when filled might be equivalent to that of the rest of the embankment, which had been settling for over a year, special care was taken in selecting and placing the material, with the result that no appreciable difference in settlement is apparent.

In July, 1930, bids were taken on three types of lining for the reservoir, namely, all-gunite, gunite slope and concrete slab bottom, and an all-concrete slab lining. All three propositions called for facing the upper 20 feet of the inside slope with Onondaga gray limestone or granite surrounded by a 6-inch top curbing of the same material. A 6-inch layer of crushed stone was placed under the lining on the slopes. At the bottom of the crushed stone is a 6-inch open jointed drain tile which is connected to a drain outside of the reservoir. The contract for grading and lining was awarded for all-gunite lining, as this construction was lowest in price. It was decided to place expansion joints in the gunite lining at intervals of 100 to 150 feet on the slopes and in squares of approximately the same dimensions on the bottom.

The concrete battens were poured below the subgrade of the lining and coated with pitch to form a slip joint. The two slabs of gunite almost meet midway on the batten, and a plastic material which is not greatly affected by a change in temperature was placed in the space between them. A copper strip, about 10 inches wide with a small "v" formed in the center for expansion purposes, was incorporated in the gunite slabs so as to form a water stop in the joint.

The gunite was shot in two layers, the first 1 inch thick and the second 2½ inches thick. The reinforcing mesh was placed after the first layer of gunite was shot, thereby insuring its proper position in the slab. Core borings from cured slabs showed that for the most part a good bond was obtained between the layers of gunite. A better grade on the crushed stone was maintained by placing this mesh after a layer of gunite had been shot. A toe wall at the top of the slope and an anchor wall about midway from the toe of the slope to the top of the embankment were placed to resist any tendency of the embankment lining to slide or buckle. Onondaga limestone was chosen for the stone facing work on the upper portion of the lining, and the same material was used for stone curbing.

E. P. STEWART,
Division Engineer, Department of Engineering, Division of Water, Syracuse, N. Y.

Items on Water Supply and Purification

80% Saving

in fire hydrant collision repair costs

and—

no flooding
no excavating
no interruption to water service
speedy repairs

The Kennedy SAFETOP Fire Hydrant is amply strong to withstand without injury any impact that fire hydrants now commonly used will endure without breaking. In case of a severe smashing impact, however, a standpipe breaking ring and stem coupling break cleanly apart, without injury to upper or lower sections of the standpipe or stem.

An additional advantage of the SAFETOP Hydrant is that the nozzles can be rotated **exactly** to any desired position without disconnecting any parts or removing bolts.

Collision repair parts for the Kennedy Safetop Fire Hydrant are supplied in sets, compactly boxed for convenient and safe keeping.

The Kennedy SAFETOP Fire Hydrant

Patent Pending

IMPACTS that would demolish any other type of fire hydrant merely fracture an inexpensive Safety Breakable Section of the Kennedy SAFETOP Fire Hydrant without injury to the major parts of the hydrant. The water pressure in the main keeps the inlet valve tightly closed so that there is no danger of flooding. No excavating is necessary, nor need the water service in the vicinity of the broken hydrant be shut off while awaiting or making repairs.

The only parts that need be renewed cost $6.00. They can be replaced by one man, with standard tools, in less than half an hour.

This unique design therefore provides the important multiple benefits of (1) minimum interruption to fire hydrant service after breakage, (2) elimination of cost and trouble of excavation, (3) inconsequential cost of hydrant repairs, (4) security from suspension of water service, and (5) protection against serious property damage and personal injuries.

Any style of fire hydrant now installed can be replaced by a Kennedy SAFETOP Fire Hydrant at low cost and without removing the existing hydrant elbow.

Every water works superintendent and fire department chief should learn the complete details of this important development. Be sure to write TODAY for full information.

The Kennedy Valve Mfg. Co., Elmira, N. Y.

KENNEDY

VALVES-PIPE FITTINGS-FIRE HYDRANTS

Construction and Maintenance

Engineering and Highway Departments

A Short History of Rubber Paving

ONE of the earliest instances of rubber paving is the area of rubber slab 2 inches thick laid in 1870 at the Arrival Platform Entrance Road, St. Pancras Station, London. In 1913 a small experiment was made in Borough High Street, Southwark, London, with rubber-capped hardwood blocks. The rubber was in the form of a capping about ½-inch thick having dovetail projections running longitudinally fitting into dovetailed grooves in a hardwood block. In 1915, after a period of one year and nine months, during which the blocks had carried traffic averaging over 190 tons per yard of street width per hour, the blocks were taken up for examination. No case of slipping has been recorded, and the upper surface of the rubber showed no signs of wear, but on removing the cap from the wood block it was found that considerable wear had taken place both on the wood and on the underside of the rubber cap. From this test, the first on record of rubber paving in a heavy traffic street, there have emerged a series of other experiments. Rubber has been attached to steel plates, expanded metal, concrete and brick, and tests have been carried out with blocks of each kind. Rubber compounded blocks and slabs without any bases of other materials have been experimented with, and inventive genius is still following the problem of rubber-surfaced roads.

The initiative in the development of rubber roadways has rested with the rubber producers. The Rubber Growers Association of England in 1915 formed an experimental company called Rubber Roadways, Ltd., for the purpose of investigating and developing new uses of rubber, particularly in the direction of road paving. Some years later the Dutch Rubber Growers Association included rubber roadway experiments as part of its research and propaganda activities, and the French Indo-China group of rubber producers has also taken up this important subject.

After some years of patient research and experiment and undaunted by failures, which are part of the price paid by all successful industries, Rubber Roadways, Ltd., produced various types of rubber road blocks. Trail lengths of rubber blocks have been laid in public streets; 50 square yards on a dock in Singapore in 1922; 220 square yards in Edinburgh in 1923; 50 square yards in Glasgow in 1923; 700 square yards on New Bridge Street, Blackfriars, London, in 1926; 150 square yards in Croydon Road, London, 1928; 300 square yards in another section of London, and 323 square yards in Rotterdam, all in 1928. In 1929, some 990 square yards were laid in Newcastle, England, 992 square yards in Glasgow, 100 square yards in Paris, and 278 square yards in Bristol, England, in 1930. All these blocks are laid on a concrete foundation, but the method of laying has varied in each case. All these experiments deal with blocks of a size easy to handle, but this record would not be complete without a reference to a test being carried out in Paris with large vulcanized rubber slabs measuring 16½ x 2 feet 7½ inches x 1 1/16 inches. These slabs consist of two grades of rubber, the upper layer being more resilient than the lower one, and are attached to the roadbed by means of bitumen. A further section has been laid in which the rubber slabs are reinforced with steel bars.

The trial areas covered a wide range of traffic conditions up to the very severe test in New Bridge Street, London, of 280 tons per yard width per hour, this being one of the heaviest traffic streets in Great Britain, a census giving 17,623 vehicles, or 51,000 tons, from 8 A.M. to 8 P.M., while there is, in addition, considerable night traffic.

It may be of interest to record that experiments with rubber paving have been carried on in the United States, where the question of vibration is causing serious concern in connection with heavy traffic over bridges. In 1924 part of the planking of the draw section of the Northern Avenue Bridge, Boston, Mass., was covered with interlocking rubber blocks. Subsequently, rubber paving was laid at the Eads Bridge, St. Louis, Mo., and a rubber sidewalk was constructed in Akron, Ohio. A strip of rubber paving has also been laid at the entrance of the Boston City Hospital. In October, 1924, a large area of rubber paving was put down on the Michigan Avenue Bridge, Chicago, Ill.

—From a booklet, "Rubber Roadways," issued by Rubber Roadways, Ltd., London, England.

122-Year-Old Marble Steps on New York City Hall

THE marble steps which lead to the front entrance of the City Hall in New York City have been somewhat worn after 122 years' service and exposure to all sorts of weather. Workmen have recently replaced them with the same material. The back steps, however, have been replaced with imitation brownstone, which has brought to light a very interesting story. When the City Hall was being built, nearly a century and a quarter ago, the then city planning committee concluded that New York City would never extend north of the present location of the City Hall and that hence no one would notice the rear of the building. Accordingly, while the front and two sides were built of marble from New England, the rear was erected of a cheaper stone. Now that the city has extended for miles above Chambers Street, city authorities keep the rear wall painted to harmonize with the marble of the front, which gives every indication of standing for a long time to come.

Detroit Operates Two Municipal Asphalt Plants

PRACTICALLY all new pavement construction in Detroit, Mich., is done by local contractors, but repaving and surfacing and repair work is done by the city through its two asphalt plants. One plant is located on the east side of the city, and the other is on the west side. These plants have a capacity of two million square yards per season, based upon straight work laid at a thickness of 3½ inches compacted, using 1½-inch binder and a 2-inch wearing surface.

During the period from 1926 to 1930 there was laid in Detroit, both by the city and by contractors, a total of 1,034,998 square yards of sheet asphalt at a thickness of 3½ inches compacted. All new paving on streets never previously paved was contracted for on a competitive basis. The Department of Public Works submits bids in competition with the private contractors on all of this class of work. If it is the low bidder, the city department is awarded the contract.

There are 27,000,000 square yards of asphalt pavement now in use in Detroit, the maintenance of which during the last six years averaged only 1.1 cents per square yard per year.

From "Well Paved American Cities—Detroit."

Paving Costs in Chanute, Kans.

IN September, 1931, the city of Chanute, Kans., awarded a contract to D. E. Minton for the construction of concrete paving, including grading and curb and gutter. The total contract price was $4,556.55, and following are the unit prices:

2,261.3 square yards of paving, 6-inch concrete slab, 1:2:3 mix, per square yard, $1.55.

820 cubic yards of grading to an average depth of 1 foot in clay soil, per cubic yard, 45 cents.

907.5 linear feet, 18-inch gutter and 6 inch curb, cost per foot, 65 cents.

Cost of day labor per day, $3.00.

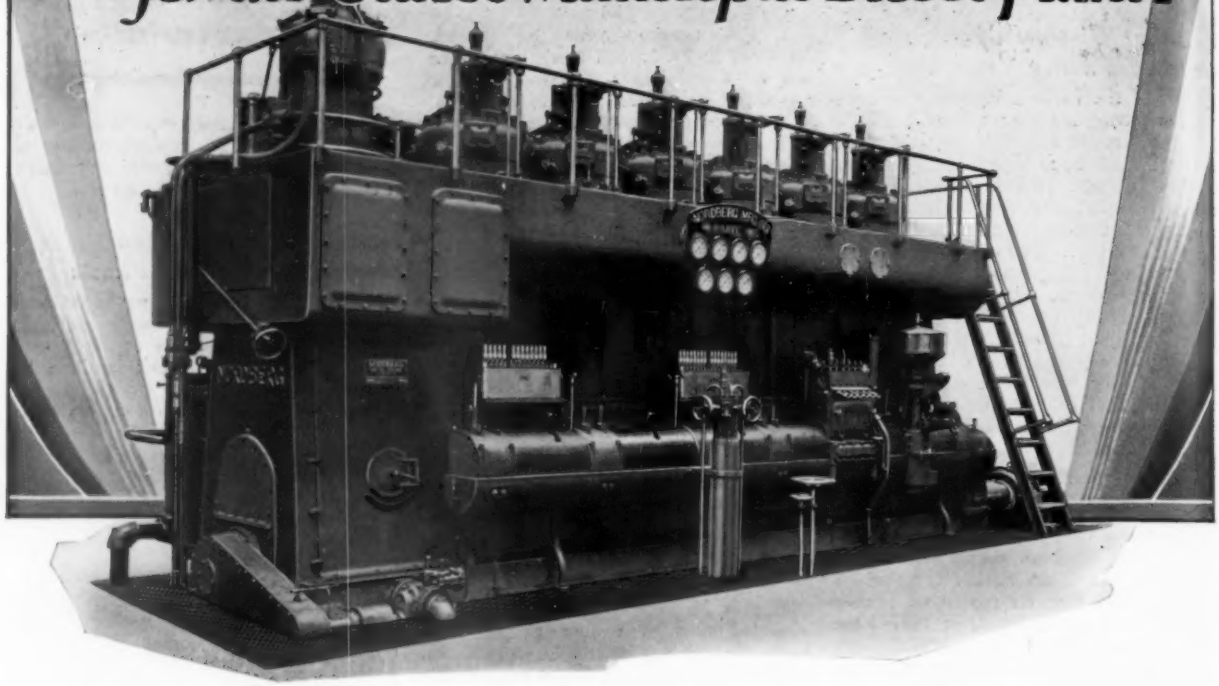
Cost of sand per ton delivered, $1.60.

Cost of crushed rock per yard delivered, $1.70.

Cost of cement per 100 pounds delivered, $1.20.

C. G. WOOD,
City Clerk

A NORDBERG DIESEL ENGINE
for the Oldest Municipal Diesel Plant



BACK in 1906, Bryan, Ohio, installed the first Diesel engine in its municipal power plant. At that time the Diesel engine was comparatively new and many were skeptical of this newly developed prime mover. Since then, it has become the accepted type of power unit for municipal service. Today—other cities like Bryan know that for low rates, reliability and profitable operation, the Diesel stands unexceled.

From time to time additional units were added to the Bryan plant, the original engines still being in service. Now a six cylinder, 1,000 K.W. Nordberg Diesel is to be installed having a capacity equivalent to the present five engines. When larger units are required, or where Diesels of better quality are wanted, many municipalities have chosen Nordberg equipment for their power needs.

In addition to an extensive line of Diesel engines, steam engines of the Uniflow type are also furnished for municipal service where this type of power unit serves to better advantage.

Nordberg Mfg. Co., Milwaukee

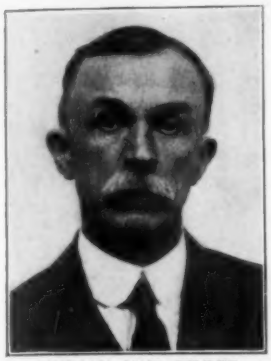
NORDBERG

HENRY M. WHITE
Supt., Water Works
Oneida, N. Y.
(Appointed 1914)

W. T. BANNING
Supt., Light & Water Commission
Milford, Del.
(Appointed 1893)

JOHN C. SCHLICHT
Gen. Supt., Constr., Hackensack
Water Co., Weehawken, N. J.
(Appointed 1929)

A. W. STEDMAN
Supt., Water Works
Canon City, Colo.
(Appointed 1925)



LINCOLN VAN GILDER
Supt., Water Dept.
Atlantic City, N. J.
(Appointed 1906)

Who's Who in Water Supply

One of a Series of Portraits of Water Works Officials Which Has Appeared Monthly Since January, 1928

JAMES M. WARDLE
Supt. of Public Works
Hudson, N. Y.
(Appointed 1929)

CHARLES H. MORRIS
Supervisor, Water Dept.
New Brunswick, N. J.
(Appointed 1915)

THOMAS G. BURKE
Supt., Public Works
Plattsburgh, N. Y.
(Appointed 1918)

S. N. VAN TRUMP
Chief Engr., Water Dept.
Wilmington, Del.
(Appointed 1918)

ALBERT L. GOSNELL
Supt., Water Works
Laurel, Md.
(Appointed 1924)

ALBERT HEARD
Supt., Board of Water Commissioners, Hagerstown, Md.
(Appointed 1892)

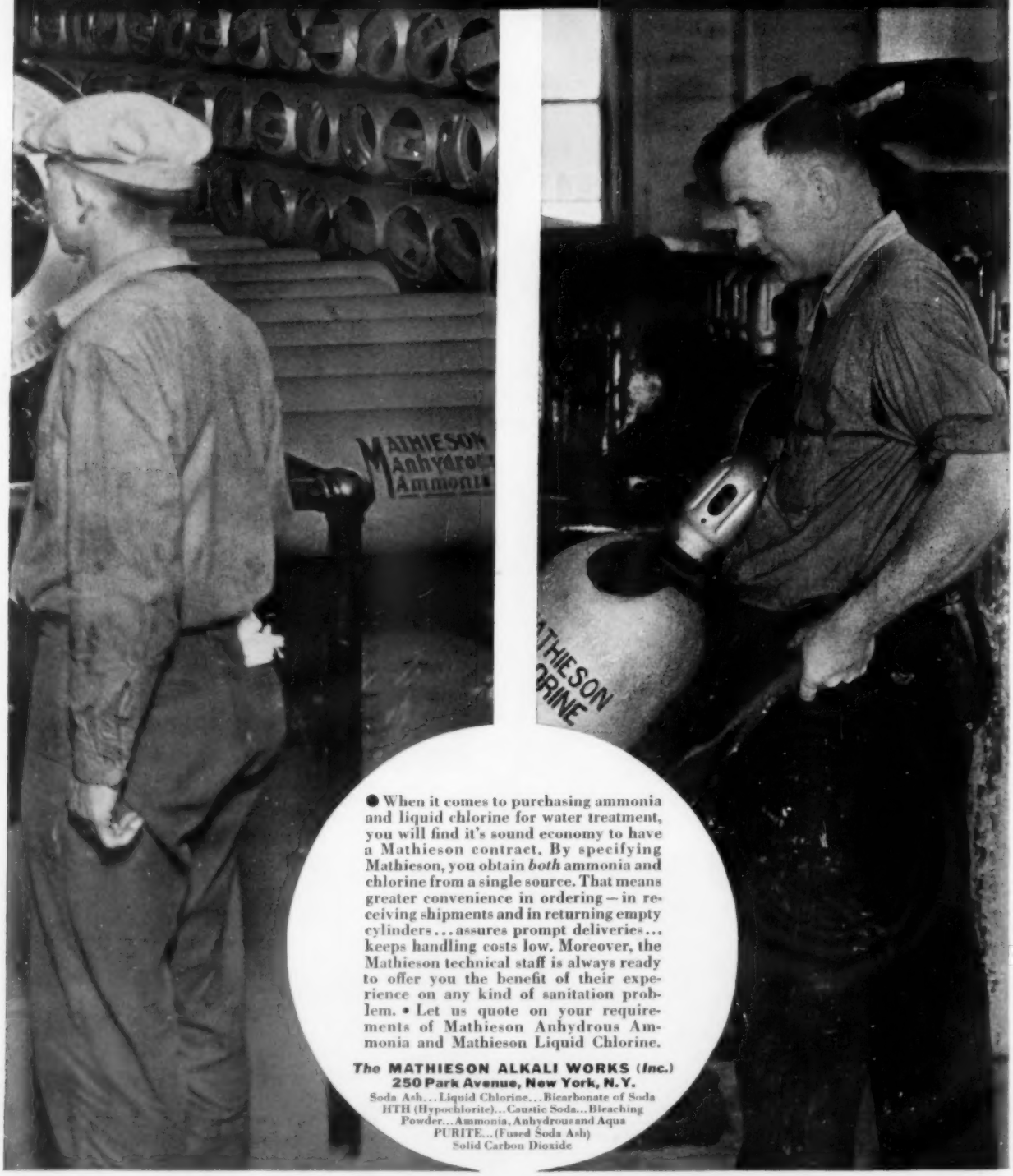
CHARLES F. LINCK
Supt., Water Department
Leavenworth, Kans.
(Appointed 1927)

HOWARD M. KING
Supt., Water Works
Springfield, Mass.
(Appointed 1922)

CHARLES W. LUDLOW
Supt., Bd. of Water Cmsnrs.
Rahway, N. J.
(Appointed 1925)

MATHIESON

AMMONIA... LIQUID CHLORINE



● When it comes to purchasing ammonia and liquid chlorine for water treatment, you will find it's sound economy to have a Mathieson contract. By specifying Mathieson, you obtain *both* ammonia and chlorine from a single source. That means greater convenience in ordering — in receiving shipments and in returning empty cylinders... assures prompt deliveries... keeps handling costs low. Moreover, the Mathieson technical staff is always ready to offer you the benefit of their experience on any kind of sanitation problem. • Let us quote on your requirements of Mathieson Anhydrous Ammonia and Mathieson Liquid Chlorine.

***The* MATHIESON ALKALI WORKS (*Inc.*)**
250 Park Avenue, New York, N.Y.

Soda Ash... Liquid Chlorine... Bicarbonate of Soda
HTH (Hypochlorite)... Caustic Soda... Bleaching Powder... Ammonia, Anhydrous and Aqua
PURITE... (Fused Soda Ash)
Solid Carbon Dioxide

Sewage Treatment Means Clean Streams

SEWERAGE and SEWAGE DISPOSAL

Lengths of Sewers in Fort Smith

IN Fort Smith, Ark (1930 census population, 31,429), the total length of sewers is 600,970 feet, or 113.821 miles, consisting of 424,280 feet, or 80.356 miles, of sanitary sewer; 79,014 feet, or 14.965 miles, of combined sewer; and 97,676 feet, or 18.500 miles, of storm sewer.

H. S. PECK,
City Engineer.

Pollution by Oil, Grease, Tar, and Gasoline

THE losses of oil, grease, tar, and gasoline, into sewers, rivers, lakes, and harbors, have become far more common in the past decade than formerly, owing to the great increase in the use of motor vehicles and to industrial expansion. A review of the present status of the loss, effect, and recovery of such substances, leads to the following conclusions of the Committee on Sewage Disposal, Langdon Pearse, Chairman, of the American Public Health Association:

1. Mineral oils are discharged into sewers, sewage treatment works, rivers, and harbors, either as somewhat viscous oils, or as volatile, inflammable gasoline and naptha. Both types of wastes are discharged from garages, filling stations and refineries. Oily wastes may amount to approximately 15 gallons per vehicle per year. It is practically impossible to estimate the loss of gasoline wastes, but the danger from such wastes is mostly of local significance when trapped in sewers. Concentrations of more than 1.5 per cent in air are explosive. Many instances of gasoline explosions in sewers are on record, particularly those at Grand Rapids, Los Angeles, and Pittsburgh.

2. Mineral oils are very objectionable at sewage treatment works. Such oils float on the surface of settling tanks, interfere with digestion of sludge, prevent satisfactory aeration of sewage and retard drying of sludge. Such oils are also very objectionable when discharged into streams, lakes or harbors. Experiments indicate that the discharge of 50 gallons of oil is sufficient to produce a silvery sheen on one square mile of water surface, and 200 gallons produces bright bands of color of oily "sleek."

3. Greases and soaps are of different character from mineral oils, but are also objectionable at sewage treatment works. Such materials, if not removed, form an objectionable and frequently odorous scum on settling tanks and in digestion tanks. Grease is decomposed fairly readily by bacterial action, however, in contrast to mineral hydrocarbon oils.

4. Tar and gas-house wastes are objectionable in streams and lakes even in very great dilution and dispersion, due to the possibility of producing odors in water supplies, following chlorination.

5. Catch-basins, skimming tanks, and grease-retaining tanks, are required in many cities by ordinance, but such measures are somewhat ineffective. Prevention of discharge of oils at the source is necessary, preferably by a system of collection and disposal, either municipal or private. Losses of oil and inflammable vapors can be traced by sewer inspection and analyses of sewer air, as at Los Angeles. Floats have been used at San Antonio.

6. Waste oils at garages should be collected systematically. Such oil can be re-refined, although it is doubtful whether such procedure is profitable. After settling or clarification, the untreated waste oil can frequently be burned successfully at garbage incinerators or for heating purposes.

7. Grease and fats from industries should be recovered, as, for example, wool grease and packing-house grease. Prevention of tar losses is largely a matter of prevention of emulsions in the plant.

8. Even with careful control at the source, unavoidable losses of oil, grease, and tar will reach sewage treatment works. Skimming tanks are now being provided at such works to remove scum. Scum may be removed from the surface of primary settling tanks or in smaller trapped grease catchers. Aeration appears to aid the separation of grease, soap, and oil, in such basins.

The Committee makes the following recommendations:

1. Operating experience with oil, grease and volatile fluids and the like should be reported by sewage works operators in their annual reports and in some accessible publication.

2. Better information should be collected on the commercial aspects of reclamation of garage oil, after collection.

3. The efficiency of various types of gasoline and oil traps on the market should be investigated.

High Spots in Operating a Sewage Disposal Plant

Pumps.—Keep them clean and in order to run.

Screens.—Keep clean. Prevent nuisance from deposits or accumulations or scattered screenings.

Tanks.—Purpose: (1) to separate solids from liquids; (2) to digest solids. Operate in series or in parallel, whichever gives best effluent. Watch pH reaction and digestion. Draw sludge frequently but carefully, know the condition of the sludge, adjusting with alum or iron if desirable.

Sludge Beds.—Keep clean, porous, with fine top layer on deep filtering media, well underdrained. Dose thin and dry quickly.

Dosing Apparatus.—Keep in order and see that the action is positive and certain.

Trickling Filters.—Secure perfect distribution, clean nozzles, have no leaks or weeps, clean underdrains, permit no surface ponding.

Contact Beds.—Have positive doses, low rates, rotation of beds, maintenance of proper cycles of filling, standing full, emptying and standing empty. Prestraining of influent is very useful.

Sand Beds.—Require adequate area, clean surface, perfect distribution, adequate underdrainage, rapid and clear-cut doses and intermittent use.

Disinfection.—Keep in operation at all times.

Tests in Records.—Keep daily and faithfully.

General.—Keep the plant cleanly in all its parts, the surroundings attractive and everything in a condition to excite favorable comments from visitors.

F. E. DANIELS,
Chief, Industrial Waste Section, Sanitary Water Board, Pennsylvania State Department of Health.

The Question of Sewer Rental in Pennsylvania

IN a paper presented before the Fifth Annual Conference of the Pennsylvania Sewage Works Association by Grant M. Olewiler, Assistant Superintendent, Health and Drainage, Lower Merion Township, Montgomery County, Pa., a very interesting summary appears which brings out the points regarding the sewer rental in a pertinent manner. They are:

1. Sewer rental is legal in Pennsylvania.

2. Sewer rental places the burden of the sewer costs on those who are benefited by their use.

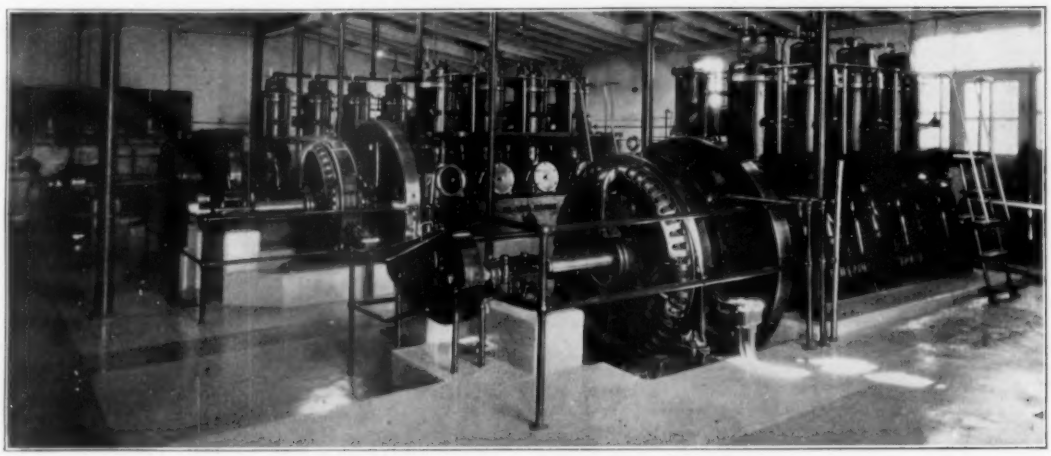
3. It is the only positive way to guarantee the existence of an account sufficient to cover the expense of the work.

4. The work of securing the information to prepare the bills, and of issuing the bills, can usually be done by the persons employed to operate and maintain the sewers.

5. The time of issuance of bills gives the property owner an opportunity to pay part of his taxes at a different time of year.

6. It is not new. Lower Merion Township has used it since 1905, and Haverford, Radnor, Abington and Cheltenham Townships and the borough of Jenkintown have used it since the completion of their original sewers.

HOW *Bloomfield, Iowa* REDUCED TAXES!



Three Fairbanks-Morse Diesel Engine generator sets having capacities of 200, 240 and 300 hp. respectively, furnish power for the city of Bloomfield, Iowa

WHEN a city reduces its tax rate from 59 mills to 39 mills in the period between 1924-1930—and reduces its total indebtedness from over $100,000 to $14,000—the means is worth investigation.

Bloomfield, Iowa, with its municipally owned and operated light and power plant, has taken full advantage of the efficiency and economy of Fairbanks-Morse Diesel Engines. Their ability to generate current at low cost permits reasonable rates to the consumer with a profit to the city.

In 1931 Bloomfield's Diesel Plant furnished the city with *free* current for street lighting to a total of over 108,000 kwh. And in addition brought into the city treasury, *a net profit for the year of $25,834.00.*

City officials and citizens interested in reduced city operating expenses and reduced taxes may secure full information on the fiscal advantages of

During 1931

$32,000 was transferred from the light plant fund to other city departments, bringing the total of such transfers in the last four years to $72,700.

F-M Diesel-operated city light and power plants by writing

FAIRBANKS, MORSE & CO.
900 S. Wabash Avenue
Chicago, Ill.

32 Branches at your service throughout the United States

FAIRBANKS-MORSE
DIESEL ENGINES

5729—OA98.73

Who's Who in City & County Engineering

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

CHAUNCEY L. RHODES
County Engr., Muscogee County
Columbus, Ga.
(Appointed 1926)

FRED L. CLARK
City Engineer
Nashua, N. H.
(Appointed 1925)

LEWIS E. BURNSIDE
City Engineer
Sharon, Pa.
(Appointed 1920)

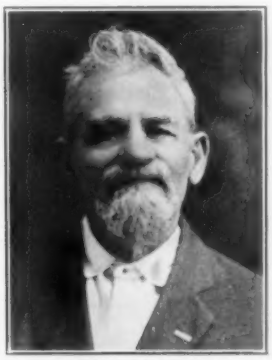
ANDREW J. HAWKINS
City Engineer
Birmingham, Ala.
(Appointed 1921)

JOHN E. WALKER
County Engr., Marion County
Ocala, Fla.
(Appointed 1922)

JOHN H. NEESON
Chief Engr., Bureau of Engineering, Philadelphia, Pa.
(Appointed 1928)

CHARLES M. REPPERT
Chief Engr., Dept. of Public Works, Pittsburgh, Pa.
(Appointed 1926)

EDWIN R. BURKE
County Surveyor, Clark County
Springfield, Ohio
(Elected 1928)



WILLIAM J. LEE
County Surveyor, Clayton County
Forest Park, Ga.
(Appointed 1892)

J. M. BOYD
County Engr., Palm Beach Co.
West Palm Beach, Fla.
(Appointed 1926)

WALTER P. JOHNS
City Engineer
Wilkes-Barre, Pa.
(Appointed 1927)

CARL E. BURLESON
County Engr., Pinellas County
Clearwater, Fla.
(Appointed 1917)

WRIGHT SMITH
City Engineer
Mobile, Ala.
(Appointed 1906)

W. W. PHILLIPS
County Surveyor, Bartow County
Cartersville, Ga.
(Appointed 1906)

What Price Tag on Safety?

POLICE MOTORCYCLES
Save Lives
Save Money

Get the facts about traffic control by motorcycles—and about the new Harley-Davidson Police models . . . A postal will bring you our latest police literature —you will find it worth filing.

ONE CHILD'S LIFE SAVED — one dangerous crossing made safe again — will justify the cost of adequate motorcycle equipment for your Police Force.

Traffic is traveling faster and faster as the new speedier cars come out on the streets. Motorcycle squads are more essential than ever before. No other means has been found nearly so effective in keeping accident-totals low. The Police Motorcycle puts "teeth" in your traffic ordinances.

An undersized or under-equipped Motorcycle Squad is false economy. What price safety for your citizens and their children?

Harley-Davidson Motorcycles for your Safety Patrol are an investment that pays huge dividends in lives saved — injuries prevented — property protected.

HARLEY-DAVIDSON MOTOR COMPANY
Dept M Milwaukee, Wisconsin

HARLEY-DAVIDSON
The Police Motorcycle

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Peekskill, N. Y.

Garbage is collected by the city of Peekskill, population 17,125, using three 2½-ton motor trucks of 8 cubic yards capacity each. On an average 35 tons of garbage are collected per day and disposed of on the village dump.—GEORGE D. EVANS, Commissioner of Public Works.

Huntingdon, Pa.

The city of Huntingdon, population 7,558, collects the garbage throughout the municipality with a 1½-ton Ford truck of 1½ cubic yards capacity. The garbage is disposed of by dumping.—A. A. BOLLMYER, Street Commissioner.

Jeannette, Pa.

A single private collector paid by the householder collects the garbage in Jeannette, population 15,126. He uses three 1½-ton trucks and disposes of the garbage on a local dump.—HALE A. GUSS, Borough Manager.

Pittsburgh, Pa.

The city of Pittsburgh, population 669,817, pays a single contractor for the collection of garbage throughout the city. The city has no record of the collection equipment used by the contractor. The garbage is disposed of by reduction.—FRED O. OBLEY, Chief Clerk, Department of Public Health.

Orangeburg, S. C.

The city of Orangeburg, population 8,776, uses five horse-drawn wagons and one motor truck for the collection of its garbage. The garbage is disposed of by dumping to fill in a swamp bottom along a river bank at the edge of the city.—D. J. SALLEY, Health Officer.

Mitchell, S. Dak.

The city of Mitchell, population 10,942, pays a single contractor for the collection of garbage. The contractor uses one 3-cubic-yard wagon for this service and disposes of the garbage on the city dump.—J. C. SCALLIN, City Engineer.

Rapid City, S. Dak.

Garbage in the residential section of Rapid City, population 10,404, is collected by the city and in the business district by private collectors paid by the property owners. The city uses one 1½-ton truck with a 2-cubic-yard body for the collection, and disposes of it by filling in low ground and burning it in the open.—E. M. SNECKENRERGER, City Manager.

Salt Lake City, Utah

In Salt Lake City, population 140,267, the city collects the garbage, using six 5-ton trucks and twenty men with teams and wagons. Table garbage is disposed of by feeding to hogs, and ashes and cans are used to make roadbeds and fill gulches in the rough area to the southeast of the city.—CITY BOARD OF HEALTH.

Richmond, Va.

The city of Richmond, population 182,929, collects garbage with seven 2-cubic-yard wagons and six 1½-ton 3-cubic-yard trucks, from April 15 to June 15. Between June 15 and July 15 and between August 15 and October 15 eleven wagons and seven trucks are used. From July 15 to August 15, fourteen to eighteen wagons and eight or nine trucks are employed. The dates of change in the amount of equipment are approximate and depend upon the amount of garbage. Collections are made weekly in winter and semi-weekly in summer. The garbage is disposed of by cremation and by delivery to farmers at the Crematory.—A. MASON HARRIS, Chief, Bureau of Streets.

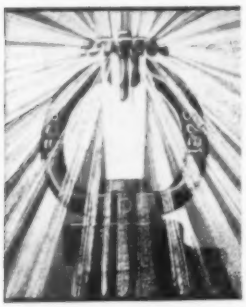
Parkersburg, W. Va.

The city of Parkerburg, population 29,623, takes bids from contractors for the collection of garbage in the city. The contractor at present uses nine 1- to 2-ton trucks and gathers the garbage and hauls it to farms, where some of it is fed to hogs and some of it used as a fertilizer. Contracts for collection are awarded by districts, of which there are ten in the city, and no contractor is permitted to operate in more than two districts.—LOUIS N. PICKENS, Superintendent of Public Safety.

Beaver Dam, Wis.

The city of Beaver Dam, population 9,867, pays a contractor $325 per month to collect all of the garbage in the city between May 1 and October 30. He collects once a week during May, June and October, and twice a week during July, August and September. The trucks must be covered and lined. The garbage is disposed of by hauling outside the city limits and fed to hogs, the remaining waste being burned.—WILLIAM A. GERGEN, City Clerk.

COLLECTION AND DISPOSAL IN ORANGEBURG, S. C.
Left.—The trash truck with a load at the city dump. Center.—Horse-drawn wagons are still used for hauling rubbish.
Right.—The dump on swamp land where new ground is being built up and mosquito breeding checked



EVERY SPRINKLER HEAD A FIRE DEPARTMENT NERVE AT N. Y., N. H. & HARTFORD R.R. SHOPS BOSTON, MASS.

Every one of the 8286 sprinkler heads in the Readville shops of The New York, New Haven & Hartford R. R. Company, at Boston, Mass., acts as a fire department nerve. When a sprinkler head operates for a fire, the plant fire brigade, and the Boston and Dedham municipal fire departments, receive an instant warning.

This is accomplished by means of the Gamewell SPRINKLER WATCHMAN—a master model municipal fire alarm box connecting the sprinkler system with the fire department. At the N.Y., N.H. & Hartford R.R. shops 12 SPRINKLER WATCHMEN are used to connect 8 wet and 2 dry sprinkler systems with the plant fire brigade, and two more are used to pass the alarms along to the Boston and Dedham municipal fire departments.

The Gamewell SPRINKLER WATCHMAN furnishes the most efficient, quickest and most economical form of sprinkler alarm service that is available today. It doubles the value of the sprinkler system to property owners and fire departments alike by making every sprinkler head a fire department nerve that will automatically "pull" a fire alarm box in addition to fighting a fire.

Our bulletin I. L. 302 explains the SPRINKLER WATCHMAN in detail—may we send you a copy?

Let Gamewell Fire Alarm Boxes Keep An Eye on the Sprinklered Property of Your City.

The Sprinkler Watchman

"It provides a very satisfactory means of bringing in a fire alarm in case of a fire near a sprinkler in an unattended building, which would undoubtedly save considerable damage in case the fire occurred at night, when there is no one around to ring in an alarm. Further, an alarm would be provided in case of false operation of sprinkler, resulting in investigation and shutting off of water before excessive damage resulted."

J. D. Rogers, Supt. of Communication
N. Y., N. H. & Hartford R. R. Company

THE GAMEWELL COMPANY
NEWTON, MASSACHUETTS

Fire—Police—Safety Items

of Interest to Departments of Public Safety

The Police and Juvenile Delinquency

THE important relationship of the police to the problem of juvenile delinquency is emphasized in a report of the Committee on the Socially Handicapped, of President Hoover's White House Conference on Child Health and Protection. The report says:

"Proposals to improve police administration include organization which will provide technical direction, the establishment of police training schools, and the development of specialized bureaus or departments, including crime prevention bureaus, juvenile bureaus and women's bureaus. Police schools, however, are still relatively few, and in some cities practically no instruction is given a police officer before assignment to duty. Police schools usually emphasize such necessary elements as marksmanship but give little attention to methods of dealing with juvenile problems or maintaining clean community conditions. The instruction of all police officers should include information necessary to enable them to deal intelligently with ordinary problems of child welfare with which they come in contact, and to recognize the more serious problems requiring special attention."

Police vs. Gangster Equipment

ATTORNEY-GENERAL WARNER of Massachusetts, in a recent address reported in the Boston *Post*, stated that until police of all our cities and towns have adequate facilities to combat gangsters, organized crime cannot be defeated. He declared that gangsters at the present time have the advantage of most police departments in that they are completely outfitted to carry on their work, while the police are obliged to operate under antiquated methods and equipment.

Minneapolis Fire Prevention Bureau Functions Effectively

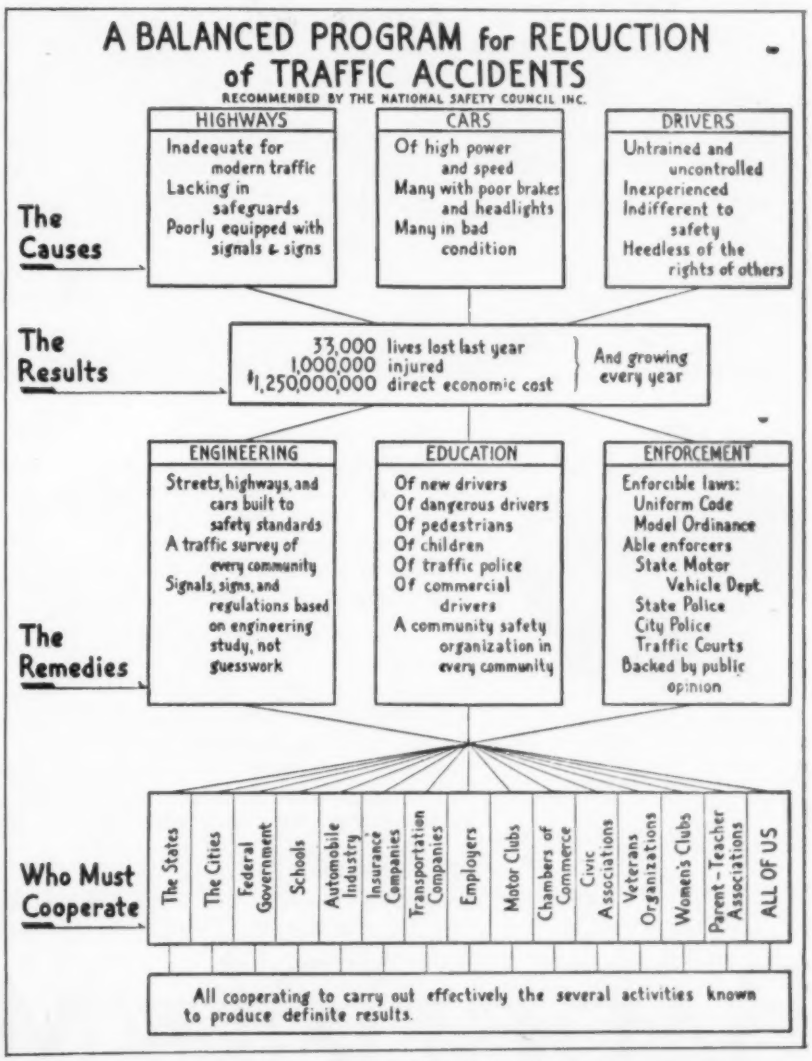
THE Fire Prevention Bureau of the Minneapolis Fire Department is credited with a substantial reduction in the number of fires and the amount of loss in that city during 1931, according to the report for that year recently rendered to the City Council by Ack D. Foster, Acting Chief Engineer. He states:

"The Fire Prevention Bureau having emerged from the status of a new Bureau in the experimental stage to a firmly established organization which has conclusively proved its worth, functions more effectively than ever. A substantial decrease has been accomplished in the number of fires and the losses thereon."

The number of fires in 1930 was 5,014, while the number in 1931, 4,487, was 10.5 per cent less. The fire loss in 1931, $1,452,393, was $59,510 less than in 1930, or nearly 4 per cent. The 1931 loss is likewise the lowest in twelve years, excepting for 1929, and is nearly 12 per cent less than the twelve-year average. The per capita loss in 1931, $3.06, is over 20 per cent less than the average for the previous twelve years, and well below the national average.

The work of the Fire Prevention Bureau is, no doubt, largely responsible for this showing. Its activities in 1931 included the following: "10,490 hazardous conditions were remedied out of a total of 42,000 inspections, 5 court convictions for arson were obtained, 1,842 oil-burner and 320 gasoline-tank installations were inspected and approved, 147 complaints and violations were turned over to the Building Inspector for correction, 183 old buildings were wrecked, 3,337 fires were investigated as to origin, etc."

The Traffic Accident Problem and Its Remedies



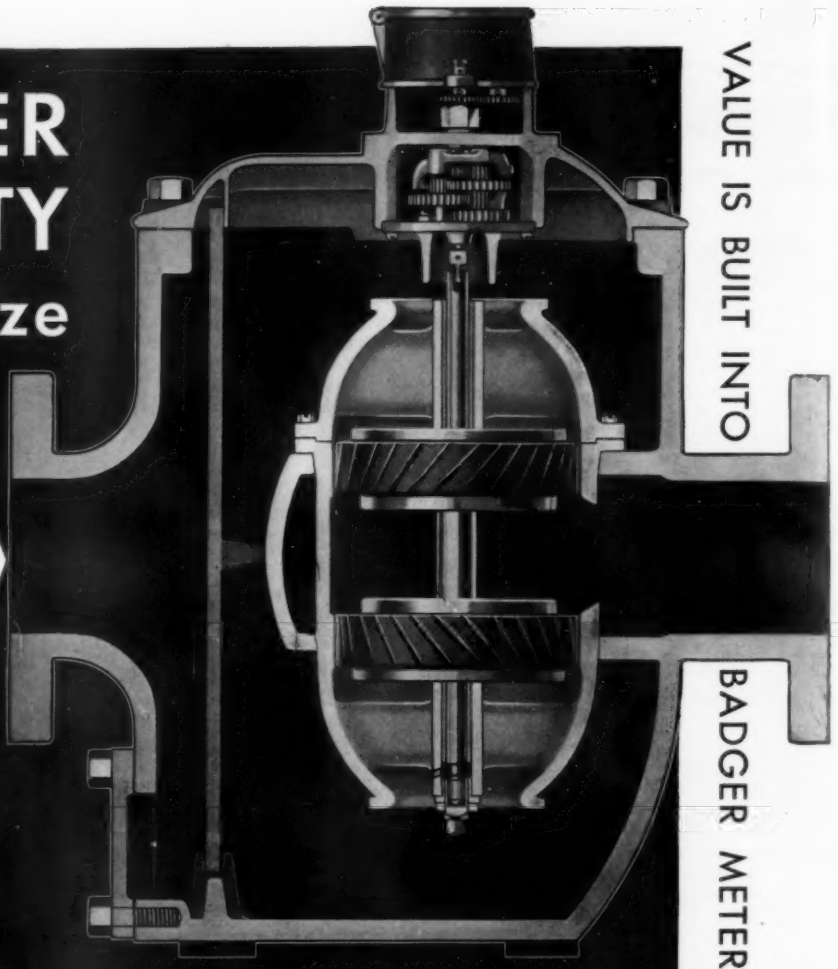
A PLAN BUILT UP BY LEADING TRAFFIC AUTHORITIES FROM THE EXPERIENCE OF SCORES OF CITIES AND A NUMBER OF STATES

A year of research by the public safety advisory committee of the National Safety Council preceded the formulation of this chart and its issuance by the Council

GREATER CAPACITY Size for Size due to . .

LARGE waterways

and minimum friction in all working parts



VALUE IS BUILT INTO BADGER METERS

Note the heavy, durable build of the Badger Turbine. Its satisfactory field performance bears out its correct design and construction.

EVERY Badger Water Meter is built for a definite service—the designs vary — sizes and capacities are different—but the underlying principles are the same—For regardless of demand there is a Badger Meter of unvarying dependability—of *true value!*

For heavy service such as railway standpipes, water supply mains, pump station meters, hydraulic elevators and the like, there is the Badger Turbine—a meter of greater capacity — a meter that shows the minimum loss of line pressure on largest water volumes. And now, as a new and added feature, a special Volume and Pressure Recorder is available.

Back of this are simplicity of design —fewer working parts—larger waterways — and the all-important Badger precise and durable construction — For the Badger Turbine is "built", every inch — embodies materials that stay "active" longer, assuring the longest years of accurate measurement at the lowest maintenance cost.

The story of "Badger Turbine construction" is told in Bulletin No. 700—Your copy is waiting, just write for it today.

BADGER METER MANUFACTURING CO., Milwaukee, Wisconsin

Branch offices in: New York City Cincinnati, Ohio Chicago, Ill. Los Angeles, Cal. Waco, Texas Savannah, Ga. Seattle, Wash. Philadelphia, Pa. Kansas City, Mo.

BADGER *Water* METERS

Information FOR YOU

THE AMERICAN CITY should always be mentioned when writing for this material which is furnished free. Keep your files up to date by checking over these items each month and writing for those you need.

CUTTING THE COST OF WATER

843. Facts about Layne pumps and well-water systems, which lower the cost of water to the city, may be secured direct from Layne & Bowler, Inc., Memphis, Tenn. If you would like to know how to secure plenty of water at low cost, send for our new and complete bulletins.

FIRE AND POLICE SIGNAL CABLE

844. A pamphlet of description and specifications for Latox fire-alarm and police signal cable, which uses a new type of rubber insulation that permits smaller diameter and less weight, may be obtained from the Simplex Wire & Cable Co., 79 Sidney St., Cambridge A, Boston, Mass.

IMPROVED ASPHALT PAVING

845. Complete information and specifications about the use of Westphalt, the improved asphalt paving material, which requires no hot-mix plant and provides smooth, noiseless, resilient surfaces, can be secured on request from the West Process Pavement Co., Inc., Louisville, Ky.

SEWER CLEANING BY TURBINE

846. A catalog describing the method of cleaning sewers by the turbine system, which employs both standard and self-propelling ferret turbines, and can clean dead-end sewers as well as through stretches, will be sent on request by the Turbine Sewer Machine Co., Inc., 5210 W. State St., Milwaukee, Wis.

CALLING A HALT ON OFFENDERS

847. Patrolite, carried by police cars on the right-hand side, can either flash STOP—POLICE in red letters, for identification, or can act as a powerful searchlight. Send to Patrolite Mfg. Co., 308 Lorain St. Bank Bldg., Cleveland, Ohio, for descriptive literature.

LOW-COST ROAD BUILDING

848. The use of Stanolind cut-back asphalts in highway construction of low first cost, which, because of general durability and resistance to traffic wear, requires small maintenance expense, is described in the Cut Back Asphalt Booklet, obtainable from the Standard Oil Co. (Indiana), 910 S. Michigan Ave., Chicago, Ill.

LEAK-PROOF FIRE HYDRANTS

849. The danger of broken hydrants, with the attendant damage caused by flooding and interferences with fire protection, can be obviated by the use of Mathews Modernized hydrants. A descriptive catalog will be supplied on request by R. D. Wood & Co., 400 Chestnut St., Philadelphia, Pa.

PAVED INVERT STORM SEWERS

850. A careful examination of your own storm sewers will explain why Armco paved invert storm sewers are advantageous. The Armco Culvert Mfrs. Assn., Middletown, Ohio, will be pleased to send literature regarding improved Armco paved invert pipes for storm sewers upon request.

PUBLIC WORKS, OR THE DOLE?

851. Municipal officials interested in modernizing their water works or sewage disposal systems as a means of putting local unemployed to work can secure valuable material from the American Cast Iron Pipe Co., Birmingham, Ala., or its branch offices in New York, Chicago, Los Angeles, Cleveland, San Francisco, Minneapolis, Kansas City, Seattle and Dallas.

A NEW DISTRIBUTOR WITH UNUSUAL FEATURES

852. The Rosco distributor, which has a seven-way valve and a folding spray bar and which can be loaded from both sides, with the hose connection equipped with quick detachable couplings at both ends for easy attaching of the auxiliary tank to the distributor, is described and illustrated in literature which may be secured from the Rosco Mfg. Co., Minneapolis, Minn.

TREES, SHRUBS AND EVERGREENS

853. A new "Planting Guide" for park and cemetery superintendents, city foresters and others has been issued by the Pontiac Nurseries, Romeo, Mich., and may be secured free on request. Selections of trees, shrubs and evergreens can be made from the 500 acres of Pontiac Nurseries.

REINFORCED CONCRETE PIPE

854. Information as to the advantages of Newark reinforced concrete pipe, which makes better joints and is easily laid at small expense, may be obtained from the Newark Concrete Pipe Co., 323 Broadway, Newark, N. J.

COPPER SULPHATE FOR RESERVOIRS

855. A valuable booklet, "The Use of Copper Sulphate in Control of Microscopic Organisms, by Dr. F. E. Hale, Director of Laboratories, Department of Water Supply, New York City, can be obtained free on application to the Nichols Copper Co., 40 Wall St., New York.

VALVES, FILTERS AND PUMPS

856. The Ross Valve Mfg. Co., Inc., Archibald St., Troy, N. Y., will be glad to supply information regarding automatic pressure-control valves, feed-water filters, portable fire hydrants, hydraulic engines and hydraulic booster pumps to city officials upon request.

HOLDERS DESIGNED FOR QUICK CHANGE OF SIGNS

857. A descriptive folder of the Quick-Change traffic sign holder for holding traffic or highway signs on any type of post, which has the advantage of permitting signs to be changed in a few seconds where this is frequently necessary, will be sent on request by Thompson Products, Inc., Cleveland, Ohio.

A NEW WELDED WELL SCREEN

858. Johnson welded well screens for water wells in sand and gravel formation, which can be made of practically any metal as best suited to conditions, are described in bulletin A-232, obtainable from Edward E. Johnson, Inc., St. Paul, Minn.

WEATHER-PROOF STEEL AND ALUMINUM SIGNS

859. The ten points of superiority of Joslin street signs are fully set forth in literature obtainable from the A. D. Joslin Mfg. Co., Merchandise Mart, Chicago, Ill.

VEHICLE-ACTUATED TRAFFIC CONTROL

860. The Trafflator system of traffic control actuated by vehicles without contact, and embodying the closed circuit principle, will be completely described upon request by the Miller Train Control Corp., Staunton, Va.

TOOLS FOR TREE SURGERY

861. A catalog describing a complete line of tools and equipment for tree work, including spraying, feeding, bolting, bracing, cabling, pruning, cavity repair, etc., will be gladly furnished to city park and forestry departments by H. E. Muench, Stamford, Conn.

WATER-METER SETTING AND TESTING EQUIPMENT

862. The Ford Meter Box Co., Wabash, Ind., has recently issued its Catalog No. 32, which describes Ford meter settings and accessories, including the new Copperhorn coupling permitting horizontal setting on vertical pipes; the 300 series of riser yokes with integrally cast inlet and outlet; and Type X meter-box cover having a hinge effect that makes for cleanliness and ease of reading.

BRICK PAVEMENTS FOR PERMANENCE

863. The record of the 22-year-old brick surface on the famous Indianapolis speedway is a convincing testimony to the permanent and satisfactory character of brick pavements. Information on the use of brick for paving will be gladly furnished by the National Paving Brick Assn., 1245 National Press Bldg., Washington, D. C.

Return this coupon and you will receive the catalogs requested 7-32

THE AMERICAN CITY MAGAZINE
470 Fourth Avenue, New York, N. Y.

I am interested in receiving the catalogs mentioned in Items Nos. .....

.....

Name .....**Title** .....

City .....**State** .....

TO PREVENT SKIDDING ON BITUMINOUS ASPHALT

864. The danger of skidding which occurs when a bituminous macadam surface becomes highly polished by traffic, can be cured by the use of the Littleford surface heater. Details of construction and use can be obtained from Littleford Bros., 500 E. Pearl St., Cincinnati, Ohio.

A NEW ROAD BROOM FOR MAINTENANCE WORK

865. Complete information in regard to the new Speeder road broom, which is a replacement unit for the cutting edge on any standard one-man maintainer or pull-type grader, and which is particularly adapted for oil penetration and gravel maintenance work, may be secured by those interested from the Speeder Machinery Corp., Cedar Rapids, Iowa.

A NEW AUTOMATIC ROAD SCRAPER

866. The new LaPlant-Choate automatic roll-over road scrapers, which are built in five sizes for use with five Caterpillar tractor models and which are designed for all types of dirt-moving jobs, are described in literature which the LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa, will be glad to send on request.

HYDRAULIC DUMP UNIT FOR 1½-TON TRUCKS

867. The Heil SL heavy-duty hydraulic dump unit for mounting on 1½-ton chassis, which is durable, powerful and fast, with a number of outstanding features, is described in literature which the Heil Co., 3000 W. Montana St., Milwaukee, Wis., will be glad to send on request.

FOUR-WHEEL POWER FOR TRUCKS

868. The Freeman Quadrive Corporation will manufacture four models of heavy-duty trucks with four-wheel drive at its new headquarters in Pontiac, Mich. Full information about these can be obtained from Major Maurice Bollstrom, President and General Manager.

A BRICK-TESTING MACHINE

869. Literature describing the Hetherington & Berner brick-testing machine, which consists of a barrel, frame and driving mechanism and conforms to the specifications of the National Paving Brick Manufacturers Assn., may be secured by interested contractors and highway officials from Hetherington & Berner, Inc., Indianapolis, Ind.

A NEW LINE OF PORTABLE AND STATIONARY AIR COMPRESSORS

870. The Le Roi Co., Milwaukee, Wis., has announced the Le Roi-Rix line of portable and stationary air compressors, the stationary models being built in six sizes ranging from 100 to 600 cubic feet displacement and the portable machine in seven sizes ranging from 18 to 310 cubic feet displacement. Complete information regarding these compressors may be secured direct from Le Roi.

A FOUR-WHEEL-DRIVE TRACTOR

871. Literature describing the Massey-Harris GP general purpose tractor with four-wheel drive, which, when equipped with various attachments, may be used for maintenance work, hauling, stump pulling, brush cleaning, road building, dredging, filling-in, snow removal and similar jobs, may be secured by those interested from Massey-Harris Co., Racine, Wis.

SPEEDY HYDRAULIC ROAD SCRAPERS

872. The use of the Root hydraulically operated speed scraper for economical maintenance of gravel, cinder, slag or earth streets will be thoroughly explained on application to the Root Spring Scraper Co., Kalamazoo, Mich.

SPIRAL-WELDED SMOOTH INTERIOR WATER PIPE

873. Armco spiral welded water pipe, made in diameters 6 to 30 inches with wall thicknesses from 7/16- to ⅜-inch and in 40-foot lengths which are light enough to be easily transported by hand, are described in the latest folder issued by the American Rolling Mill Co., Middletown, Ohio.

DIESEL ENGINES

874. Stationary diesel engines manufactured by the Worthington Pump & Machinery Corp., Harrison, N. J., are described in five separate bulletins covering the following sizes, respectively: 50 to 150 hp., 150 to 300 hp., 225 to 450 hp., 300 to 600 hp., and 375 to 1,000 hp., which will be gladly sent by the company on request.

PROTECTION FOR THE EDGES OF PAVEMENTS AND CURBS

875. Godwin steel paving guards for the protection of the edges of concrete and asphalt streets and roads, curbs and railway paving are described in Booklet N, which is replete with illustrations and may be secured from the W. S. Godwin Co., Inc., 12 E. Lexington St., Baltimore, Md.

SPECIAL NURSERY STOCK PRICES FOR MUNICIPALITIES

876. Those interested in city parks, street and cemetery planting are invited to write to W. & T. Smith Co., Geneva, N. Y., for its wholesale price list for large municipal orders.

EASILY INSTALLED CAST IRON PIPE

877. De Lavaud cast iron pipe with self-centering shoulder in the bell, lighter in weight yet 25 per cent stronger than pit cast pipe, and made in accordance with the revised Federal specifications for cast iron bell-and-spigot type, as well as the A. W. W. A. and A. G. A. specifications, is listed in the latest literature of the United States Pipe and Foundry Co., Burlington, N. J.

A DEVICE TO ELIMINATE CHATTER FROM MOLDBOARDS

878. The Chatabator, a device which completely eliminates all chatter and holds the moldboard of a grader rigid, relieving the blade of strain and the tendency to gouge, lightening the operator's work, making the steering easier and completely eliminating washboards, is described in the literature of the Rosco Mfg. Co., Minneapolis, Minn.

A SEWAGE SLUDGE CLARIFIER

879. The Laughlin clarifying tank for the removal of finely suspended matter in sewage treatment plant tanks is illustrated diagrammatically and described in Bulletin T issued by the Filtration Equipment Corp., 350 Madison Ave., New York.

SANITATION EQUIPMENT FOR SEWAGE AND WATER TREATMENT

880. Catalog No. 208 issued by the Chain Belt Co., Milwaukee, Wis., describes Rex sanitation equipment for both sewage and water treatment, including chain and scraper type sludge collectors, Tow-Bro nozzle type sludge removers, single and double plunger and diaphragm type sludge pumps, and mechanically cleaned bar racks and fine screens of the band and drum type for sewage treatment and traveling intake screens for water treatment.

SAFE AND PALATABLE DRINKING WATER

881. The drinking water furnished by any water department or water company may be perfectly safe bacteriologically and chemically but still be unpalatable to the consumer. It is only within a relatively short time that the value of activated carbon in powdered form, known as Nuchar, has been applied to water-works practice for the removal of chemical odors and tastes produced by algae. A history of Nuchar and the development of it as a taste and odor remover has been prepared by the Industrial Chemical Sales Co., Inc., 230 Park Ave., New York, in a booklet entitled "Palatable Drinking Water."

GALVANIZED SHEET STEEL PRODUCTS

882. Superior Galvannealed sheet steel, which is zinc-coated by a special patented process that renders it highly rust-resisting, and thus particularly adapted to such uses as route markers, warning signs, waste receptacles, etc., is described in a booklet which, with a sample, will be sent on request to city officials by the Superior Sheet Steel Co., Canton, Ohio.

LAWN-MOWER CUTTING BLADES

883. A descriptive folder explaining the advantages of Brunite blades for lawn mowers, which are made of specially processed Swedish steel, designed to insure a lasting keen cutting edge, may be obtained from the Brunite Co., 1940 E. 6th St., Cleveland, Ohio.

ARMS EQUIPMENT FOR POLICE

884. Catalog No. 40 of the H. & D. Folsum Arms Co., 314 Broadway, New York, describes its complete line of revolvers and allied equipment for police, together with other types of arms and sporting goods.

BITUMINOUS ROAD BUILDER

885. Iowa Mfg. Co., Cedar Rapids, Iowa, has developed the Cedar Rapids bituminous road builder, a road mix plant which takes windrowed aggregates from the road, thoroughly mixes them with the proper proportion of bitumen and delivers them in a windrow at the rear of the machine. A bulletin, "Do It the Better Way," describes this machine in detail.

WIRELESS WELL STRAINERS

886. J. H. McEvoy & Co., Houston, Texas, has issued an illustrated catalog completely describing McEvoy wireless well strainers for water wells. Copies of this catalog may be secured by any water-works officials interested.

AERATION OF SEWAGE

887. A new type of sewage aerator, the Dorrco, with revolving paddles directing the sewage downward against the ascending diffused air, for greater efficiency, has been brought out by The Dorr Company, 247 Park Ave., New York, which will gladly send information on request.

CAST IRON WATER AND GAS PIPES

888. Information regarding Warren cast iron pipe and special castings, including high-pressure fire-service pipe and Warren short-body specials, in sizes from 2 to 60 inches, for mnicipal water or gas systems, can be obtained from the Warren Foundry & Pipe Corp., Bowling Green Bldg., New York.

NON-OSCILLATING PRESSURE REGULATORS

889. A new line of hydraulic valves designed for water-works and hydro-electric power generation lines has been announced by Baldwin-Southwark Corp., Philadelphia, Pa. These valves, which are described in a bulletin, include slow-closing check valves with an adjustable rate of closure, pressure regulators which function without oscillation, surge suppressors, altitude valves, automatic air valves, throttling valves and automatic gate valves.

ALL-RUBBER MARKERS FOR TRAFFIC LINE WORK

890. Markers with molded red rubber bases and staffs with fast-color bunting flags for preventing traffic from crossing freshly painted traffic lines are illustrated and described in the literature of the National Highway Marker Co., Oaklyn, N. J.

A COMPLETE NURSERY STOCK

891. Nursery stock of unexcelled quality, including ornamental trees, shrubs and hardy perennials, is included in the latest price list of Henry Kohankie & Son, Painesville, Ohio.

PORCELAIN ENAMEL STREET SIGNS

892. Porcelain enamel plates and street signs which are guaranteed for ten years against fading and chipping and have as a base certified malleable iron frames, and which are adjustable to any angle, are described in the literature of the Traffic and Street Sign Co., 86 Foundry St., Newark, N. J.

AERIAL SURVEYS AND MAPS

893. The advantages of air maps for municipal officials, including city engineers, city planning boards, zoning boards, water departments, engineers, and tax officials and assessors, are great. Complete information may be secured from the Airmap Corporation of America, Sperry Bldg., Brooklyn, N. Y.

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Cost Accounting for Street Sanitation in Troy, N. Y.

By ALFRED E. ROCHE, M. Am. Soc. C. E.,
Commissioner of Public Works

Some Results of One of the First Five Installations of Accounting Systems by the Committee on Uniform Street Sanitation Records

THE population of the city of Troy is 75,000. It borders the Hudson River for a distance of 7 miles and has an area of 9.75 square miles. Its flat terrain lies adjacent to the river for a width of half a mile. It then rises abruptly to an average elevation of 120 feet above the river. One hundred twenty-six miles of streets are laid out, 92 miles of which are improved with permanent types of pavement. One-third of the street mileage is on grades over 5 per cent. The average width of the streets between curbs is 38 feet.

The Hudson River is 1,000 feet wide for its distance along the city of Troy. Many bridges join Troy with the cities of Watervliet and Cohoes, also with the villages of Green Island and Waterford. The combined population of these communities is 45,000. Troy is the trading center of a population of 165,000 within a 6-mile radius of the City Hall.

Waste Collection

The collection of municipal waste is accomplished by a fleet of fourteen 5-ton trucks, supporting bodies of 10-cubic-yard capacity. A combined system of collection is maintained. Cartons, garbage, ashes, papers and refuse of all kinds are handled in one operation. In the commercial section, 2.5 square miles in area, daily collections are made, while in the residential sections the collections are semi-weekly. The employees are instructed to remove waste of every kind offered on the curb line.

The chauffeurs and tractor operators are paid $30 weekly; the laborers—called "barrel pitchers"—are paid $30 weekly; thirty-seven laborers, fourteen chauffeurs, two tractor operators, and one general foreman constitute the immediate force removing and disposing of municipal waste. Back of this force is a well-equipped central garage, manned by seven mechanics.

The collected waste is disposed of by filling swamp land, and covering with clay, loam or gravel.

The Beginning of Cost Accounting

The International Association of Public Works Officials was desirous of ascertaining the cost of performing certain sanitary operations in various cities. In order to make comparisons, uniform records had to be kept.

Five cities were selected as a trial to secure uniformity. Troy represented municipalities between the 50,000 and 100,000 population class. The system was installed in June, 1931, and furnishes a good control over public works expenditures.

Table No. 1 shows six months' costs of collecting and disposing of municipal waste. It shows all the labor,

TABLE NO. 1

COST OF GARBAGE AND ASH REMOVAL AND DISPOSAL, SIX MONTHS, 1931

Month Operation	Field Labor	Equipment Expense	Materials Supplies	Capital Outlay	Overhead	Total Cost	Cubic Yards	Cost Cubic Yard
July								
Removal	$6,242.53	$1,789.00	$131.05	.....	$149.45	$8,312.03	$8,262	1.00
Disposal	598.43	363.00	109.86	500.00	17.65	1,588.94		192
	6,840.96	2,152.00	240.91	500.00	167.10	9,900.97		1.192
August								
Removal	5,953.14	1,537.60	69.65		123.51	7,583.90	7,599	1.01
Disposal	566.14	291.50	12.19	500.00	14.45	1,384.58		182
	6,519.58	1,829.10	81.84	500.00	137.96	9,068.48		1.192
September								
Removal	5,970.02	1,515.60	16.43		1 3.25	7,635.40	7,780	98
Disposal	568.30	318.65		350.00	15.45	1,252.40		173
	6,538.32	1,834.25	16.43	350.00	148.70	8,887.80	7,780	1.153
October								
Removal	6,240.64	1,589.60	16.80		167.35	8,014.39	8,774	91
Disposal	595.15	324.00		175.00	19.62	1,113.77		127
	6,835.79	1,913.60	16.80	175.00	186.97	9,128.16		1.037
November								
Removal	5,940.02	1,546.70	21.50		189.95	7,698.17	8,512	90
Disposal	600.95	368.00			22.90	991.85		116
	6,540.97	1,914.70	21.50		212.85	8,690.02		1.016
December								
Removal	6,392.50	1,701.60	7.28		173.33	8,274.71	10,215	81
Disposal	575.45	312.00	6.53		19.04	913.02		089
	6,697.95	2,013.60	13.81		192.37	9,187.73		899
Totals	$40,243.57	$11,657.25	$391.29	$1,525.00	$1,045.95	$54,863.16	$51,142	$1.073

equipment, expense, supplies, and overhead entering into the cost of that class of public work. It shows the amount of refuse collected. An unusual amount was gathered during the month of July. We are unable to account for this.

The driver of a municipal truck delivering material to the disposal ground has his work card placed under a time stamp, indicating the minute, hour and date of his delivery at the disposal field. There is little room for deception in the volume of materials collected.

The table clearly shows a decreased cost for work performed in each month after the installation made by the International Association of Public Works Officials. It indicates a greater amount of material collected each month. It further indicates a reduction in the expense of maintaining equipment. These facts speak for themselves.

Table No. 2 shows the number of cubic yards collected daily and monthly. It also shows the total number of trips made from the collection district to the disposal field. The average distance from the collection district to the disposal field is 3.1 miles.

TABLE NO. 2
GARBAGE AND ASH YARDAGE AND TRIPS, SIX MONTHS

Month	Working Days	Trucks Per Period	Trucks Daily	Cu. Yds. Per Period	Cu. Yds. Daily	Cu. Yds. per Truck Daily	Trips Per Period	Trips Daily	Trips per Truck Daily
1931									
September	26	349	13.4	7,780	299.2	22.29	844	32.45	2.4
October	27	354	13.1	8,774	325.	24.79	938	34.74	2.65
November	25	352	14.08	8,512	340.	24.14	925	37.	2.6
December	26	364	14.	10,215	393.	28.07	1,148	44.15	3.15
1932									
January	26	381	14.65	10,069	387.	26.43	1,170	45.	3.07
February	25	360	14.4	9,997	399.9	27.77	1,143	45.72	3.17
Summary	155	2,160	13.94	55,347	357.	25.61	6,168	39.8	2.85

The city is divided into seven sanitary districts. Table No. 3 is information of a typical district. All trucks travel 323 miles per day. Each consumes 10.6 gallons of gasoline daily, and 0.9 quarts of oil. They are the 5-ton chassis type. We have calculated the cost per cubic yard for collecting, transporting and disposing of the municipal waste, as Table No. 1 shows.

TABLE NO. 3
FOREMAN RYAN'S DISTRICT
102ND STREET TO 126TH STREET, HUDSON RIVER EASTERLY

Miles of street in district	36.8 miles
Miles of street traversed in day's collection	12.9 "
Distance from garage to center of district	1.6 "
Distance from center of district to disposal	5.7 "
Number of trips from district to disposal	4.6
Miles of street traversed in collection time	12.3 "
Number of trucks used	2.0
Miles traversed daily	70.6 miles
Miles traversed daily empty	32.2 "

With this equipment and force we collect in a day of seven working hours all that is offered. Portions of this equipment perform other classes of service daily, such as the removal of material collected from sewers by hand, materials caught by motor-driven street-cleaning equipment, catch-basin cleanings occasionally done by hand, the transportation of lumber, brick, sand, gravel, cement and pipe from the stock yard to sources of use.

The municipal budget is $3,650,000. The Public Works budget is $600,000, exclusive of the Water Bureau. Capital expenditures increase the responsibility in the Public Works office to an average of $350,000 more annually. The sum allocated to waste removal and disposal is $101,725.

The sum allotted to garage operations is $29,700. Out of this we pay mechanics' wages, as well as the cost of parts required for repairs.

All equipment used in this work is owned by the city. It has been purchased since 1928 out of current funds.

Factual Analysis

The trucks travel 323 miles daily. They traverse 49.5 miles of streets in loading. They move loaded to a disposal field, and travel 114 miles in doing so. They travel 159 miles empty, which includes the return trips and the initial distance from garage to center of district in the morning. Almost 50 per cent of the travel is non-pay loads.

Table No. 1 shows a cost of $54,863 for a six-months collection period of 155 working days, or $354 a day. Each day shows 323 miles of travel, hence a cost of $1.10 per mile per day. Each truck—Table No. 2—collects 25.6 cubic yards, hence a cost of 0.043 cents per mile, per day, per cubic yard. Each truck travels 23 miles daily, using 10.6 gallons of gasoline, making 2.2 miles per gallon of gasoline. One may say this is a low mileage figure—it is for an ordinary business. We are anxious to be shown what it is in a similar business in cities of like size.

No class of trucking business is comparable in wear and tear to the collection of garbage, ashes and municipal waste. The city truck in making a house-to-house collection applies the power of the engine, and brakes of the rear wheels, every fifty feet during loading periods. It is the constant starting and stopping, particularly on the hill sections, which reduces mileage, consumes time, and increases the cost of operation of garbage trucks.

The tables tell the story. Other municipalities may produce better results. These facts are submitted with the belief that they are creditable to the city, and to the International Association of Public Works Officials.

"ECONOMIES" THAT DEEPEN THE DEPRESSION

MANY absurd attempts to save money for taxpayers by curtailing services essential to modern city life have been brought to the attention of THE AMERICAN CITY in recent weeks. In one suburban community, for example, municipal garbage collection has been discontinued—and citizens are now paying more to private contractors for this service than they formerly paid in taxes. In another town the lamps and globes have been ordered removed from the ornamental lighting standards—and whether the citizens will have to hang out lanterns for street lighting has not yet been disclosed.

In still another municipality—a city of over 40,000 population—the governing body in its wisdom decreed that no paving or other improvements be undertaken during 1932—and the office of city engineer has since been abolished! Next?

The *reductio ad absurdum* of this sort of thing is graphically set forth in the June number of *The Wharton News* by Clarence G. Shenton, of the Philadelphia Bureau of Municipal Research. Asking what would be the price of freedom for the average home owner of Philadelphia if relieved of the $150 or less of locally imposed taxes he now pays, Mr. Shenton says:

"Who can picture it? There would be no public schools; no police and fire protection; no ash, rubbish and garbage collection; streets dirty, not repaired, not lighted at night, not protected by traffic signals; every man for himself in getting pure water and food and in fighting contagious diseases; city hospitals and clinics closed; playgrounds, recreation centers, swimming pools closed; courts not operating; jails and places of detention emptied; and so on and so on. Even with all the inexcusable waste, one wonders what our average home owner gets for any other $150 he spends that is worth as much to him as the services rendered by his local governments."

Resurfacing a Main Thoroughfare

Newnan, Ga., Regained the Approval of Local and Through Motorists When Greenville Street Was Resurfaced with Brick

By THEODORE REED KENDALL
Engineering Editor, The American City

PRIOR to the resurfacing of Jackson and Greenville Streets, the main thoroughfare for north-and-south traffic on U. S. 29 and Georgia Route 1, in Newnan, Ga., the city was roundly criticized by all travelers for the roughness of the street. This has been overcome by laying 35,000 square yards of vitrified brick paving during the early summer, so that the street is now smooth, clean and satisfactory to all. The old street was a penetrated macadam that had not been maintained sufficiently to keep it in shape to carry the heavy loads of cotton and other commodities that are trucked through here in increasingly large numbers.

Before any work could be done to lay brick, it was necessary to bring the old road up to a uniform grade with a varying thickness of cold patch material to provide a level base. It was thought by some Georgia officials that it would be impossible to lay the brick on the old pavement. The superintendent for the paving manufacturer who had charge of the work knew the value of the old well-compacted base and used it to good advantage. The cold patch was rolled with a 4,800-pound hand roller, which was pulled back and forth by six men and, although not as heavy in its entirety as the usual steam or gas roller, had as great a unit compaction as the larger machines. It had the further advantage, in these times, of making possible the employment of several extra men now and then. The cold patch material was made with crushed granite from ½-inch to material passing a 10-mesh sieve. This fine mixture prevented voids in the base through which the sand cushion for the brick might run out. At street intersections the cross streets were brought up to the new grade with Amiesite.

The question of providing the new paving without causing any trouble with drainage through the reduction in the height of the curbs was one of the real problems of the work. It was solved by using 2½-inch brick in the gutters. The concrete curbs were 6 inches high, and the use of the 2½-inch brick with a ½-inch bedding course of sand made the curbs still 3 inches high to take care of water running in the gutters. Further advantage was realized by the great improvement in flow in the brick gutters. The old gutters were of rubble-stone and seriously slowed up the flow of water, so that the new brick gutters with their smooth surface were as effective in the removal of water even though the curb height had been reduced.

Another problem was the changing of the width of the street at one point from 50 feet to 31 feet and the need for taking care of the heavy traffic at the numerous intersections. These things were done effectively by the use of different ways of laying the brick, such as the straight pattern across the streets, and the lines were kept remarkably straight by an ingenious method which will be described later, the use of the herringbone pattern at the heavy intersections, and the laying of the 2½-inch brick the long way of the gutter where the old rubble gutter had been used. The thinner brick were laid against some old 6-inch curb for a width of 32 inches with the usual sand cushion and still furnished a 3-inch curb. In a few sections where the old curb was very low, the city did pour a new concrete curb back of the old curb and carry the new curb up over the old to form an integral curb. The area back of the curb will be regraded.

Preparing the Sand Cushion

A novel method of preparing the sand cushion was used on the entire job, and its value was particularly apparent on the 50-foot width of street, where it would have been rather difficult to use any kind of template that would have spanned the entire street. Screened bank sand was used for the bedding course, which ran in thickness from ½- to ¾-inch. On the 50-foot pavement seven brick were set across the base on sand at the proper elevation for the finished pavement. The engineers gave these grades every 50 feet, and four sets of the guide brick were set between. The guide bricks were set at the center, quarter and eighth points of the pavement. Then, with two sets 25 feet apart, a string was stretched from one brick to the next, parallel to the center line of the pavement, and held taut with other brick. With a bat a laborer leveled a stretch of sand beneath the string so that the exact grade of the bedding course was determined. With the sand spread and rolled between two such lines of prepared grade, it was possible for an experienced man with a lute to grade the remainder of the bedding course with remarkable accuracy. In this manner the entire length of the bedding course was finished and the resulting smoothness of the pavement attests its reliability. The sand cushion was rolled with a 250-pound hand roller such as is used for rolling lawns, with the weight made up by the water content of the roller.

Dropping the Brick

The brick supply contract for this work was awarded to the Southern Clay Manufacturing Co., of Chattanooga, Tenn., which provided a superintendent, two droppers and the lute man as part of the contract. The brick were delivered well ahead of actual construction and stacked along the park area between the curb and the sidewalk in sufficient quantities to take care of the width of street in front of the curb at that point.

One dropper kept ten men busy carrying the brick from the curb storage to the piles made up across the street. The carriers used tongs which held four brick each, and were required to see that the brick were clean before de-

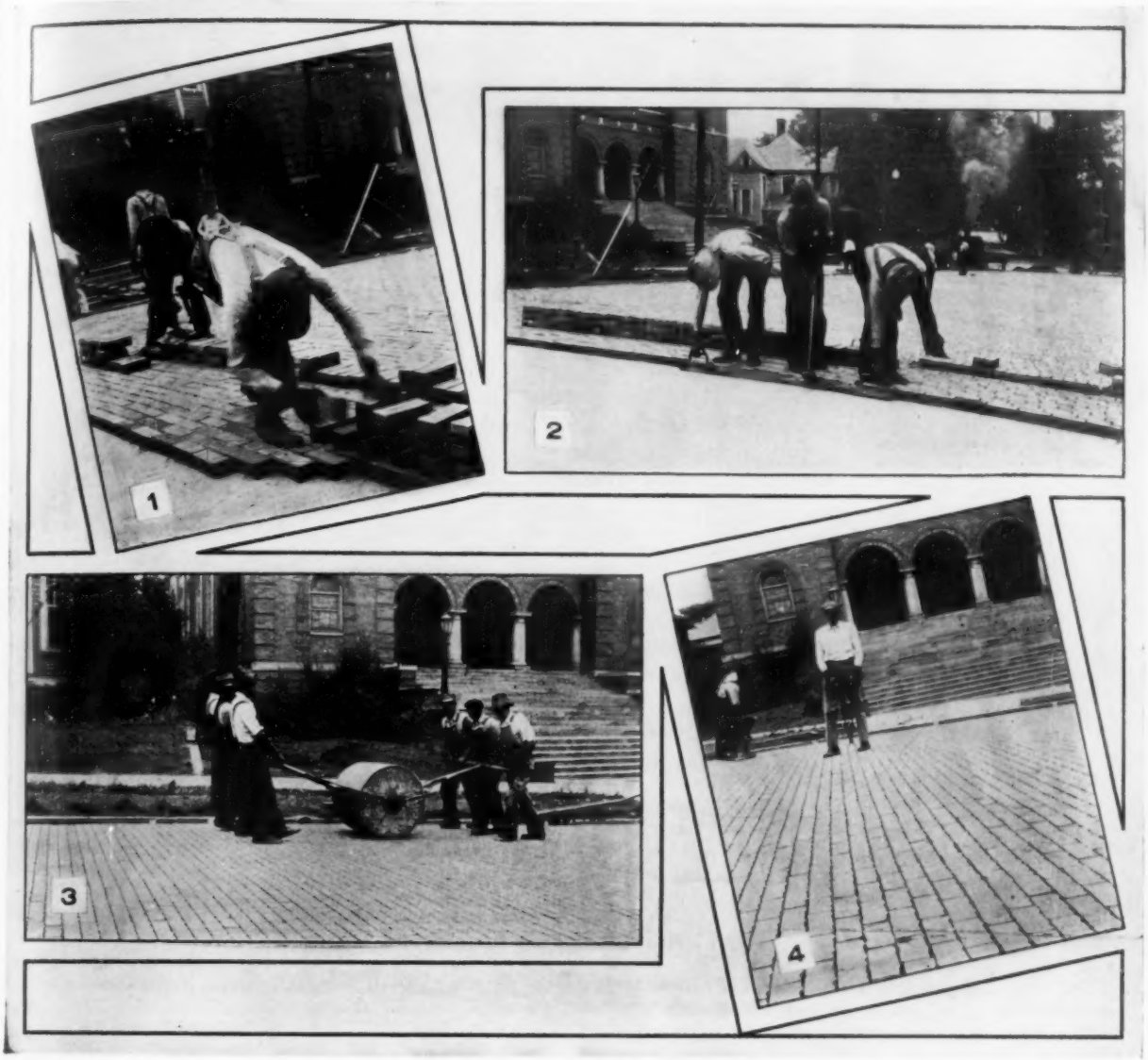
PREPARING THE SAND CUSHION

1. A view on La Grange Street, showing a gutter condition similar to that encountered on the paving on Greenville Street. Method of setting the grade of the sand cushion. 3. Rolling the sand bedding course. 4. Using a hand lute to secure an even grade for the bedding course

positing them in the street. The dropper that the contractor furnished laid 48,642 brick in 9 hours' actual working time on this job. He carried four lines of brick across the street at one time, tapping and placing them as regularly as though he were a machine. A second dropper, who was carried on the payroll, sometimes started the rows out from the side, but his principal duty was to direct two men with a 2 x 4 about 6 feet long with handles at the ends, which was placed against the line of brick every eight or twelve rows where there was any sign of the rows being slightly out of alignment, and a third man hit the 2 x 4 with a sledge to keep the line straight. The reason for the accuracy of the lines of the brick throughout the entire job is explained by this simple method of keeping them so.

One man on either side placed the bats and also did the work on any dutchman that was placed where there was a slight curve in the pavement, or where for some reason one side of the pavement seemed to progress faster than the other. The true line was again established and the first line of brick set to the new line and the slight wedge-shaped spaces made up with bats of different lengths that were broken by the two bat men especially for this purpose.

After the brick were laid and the pavement swept, the culls were removed with tongs, and such brick as had been dropped with the lugs in the wrong direction were turned, and the pavement was rolled with the 4,800-pound roller. Then it was checked with a 10-foot straightedge for any variation in the surface greater than ¼-inch in the 10 feet. These places were marked with blue chalk, whether the depression was a single brick or a group, and the brick or bricks were removed, the sand cushion adjusted and the bricks replaced, rerolled and again checked. After the entire surface for about 50 feet of pavement was checked, it was ready for pouring the joints.



PAVING IN PROGRESS ON GREENVILLE STREET

1. This man dropped 48,642 brick on this job in one 9-hour day. He carried four lines of brick across at one time. 2. This 2 x 4 and sledge assured snug fitting of the brick as spaced by the lugs. 3. Rolling the brick before straight-edging. 4. Culling brick with tongs. Note the fine lines and ample spacing for the asphalt joints

Pouring the Joints

With the Dunn lug brick which were used for both the 2½- and the 3-inch size and in the relative amounts used, about 11½ pounds of the Texaco No. 39 brick filler was needed. For straight runs of the 3-inch brick, 12 pounds per yard was needed. The joints were poured with a Littleford one-man squeegee, which was run across the pavement, lapping the runs half each time, and then when the cross runs were completed the pavement was squeegeed lengthways.

The Texaco asphalt was received in metal drums which were split open at the site and cut into suitable sizes for easy handling. Two men handled the cutting of the asphalt and the wood fires of the two 500-gallon Honhorst asphalt kettles. They were fired with the old wood blocks from sections of the street that had been previously relaid with brick. Five men with coal hods, each filling his own hods at the kettle, were required to keep up with the man using the squeegee. An extra man with a hand steel squeegee followed the Littleford squeegee to take care of any excess material that might flow out if the man operating it went too slow. About the only time he was needed was at the turns at the curbs, and there he smoothed out the excess flow, since the operator did not use the cut-off provided on the squeegee.

As soon as the joints were filled by the cross squeegeeing, the pavement was covered with a light spread of hand-cast sand and was opened to traffic if there was any need of that section and it did not interfere with the kettles or any other operations.

Costs

This work, which was financed by the city of Newnan and Coweta County, was a great boon to the unemployed in the community. It gave continuous employment to about 45 local laborers for two and a half months. The brick were purchased for $27.50 a thousand, and the

COMPLETING THE PAVEMENT

1. A "dutchman," a method of making curves or taking up slight inequalities in line. 2. Paving the dutchman with bats. 3. Applying the asphalt filler with a squeegee. 4. A section of completed pavement on Greenville Street, showing one of the fine residences

asphalt for $13.00 a ton, both F.O.B. cars delivered.

The work was done under the direction of Frank Stripling, Chairman of the Street Committee of Newnan, Ga., with J. E. Gilbert, Superintendent of Streets, in charge of the laborers. Phillips Moore was Engineer for the State Highway Department, and T. J. O'Neill was the representative of the Southern Clay Manufacturing Co., of Chattanooga, Tenn.

Bids for Engineering Services—Another Aspect

To the Editor of THE AMERICAN CITY:

In the October, 1931, issue of THE AMERICAN CITY appeared an article entitled "Bids for Engineering Services," with the query, "A Reflection upon Officials? or upon Engineers?" This article dealt mainly with the engineer who acts for the municipality or other public body in the capacity of a consulting engineer and who is to be retained for some particular piece of work, and with the proper and improper manner of his retention.

There is another phase of work undertaken by professional engineers which is subject to the same abuses as that of the consulting engineer, namely, the work of the engineer who is retained by city, state, or Federal Government for the purpose of inspecting materials at points of production, and also the erection or construction of public works.

There goes into the construction of public works a great variety of materials, all of which pass through some process of manufacture or fabrication, either at the point of production or at the site of incorporation in the actual construction, and all of these are subject to the inspection of the representative of the owner.

Generally speaking, but few of our public bodies—be they city, state, or Federal—are carrying on work throughout the year in sufficient quantity to warrant the permanent employment of an engineer who is trained to specialize in efficiently judging the quality of materials for water supply, bridges, power plants or other projects, or who is specially trained to judge the quality of the construction during this period of a project. In order to get the best men for these services, it is widely customary to retain temporarily some organization qualified by training and experience to furnish inspecting engineers specially fitted to pass upon the materials and the construction.

A properly qualified inspector should be capable of writing the specifications under which the materials are to be furnished, to properly interpret the plans of the job or parts thereof, and should have a practical knowledge of what constitutes proper and improper materials and construction, and be capable of directing how the materials are to be made or the construction work done. He is therefore a specialist and must have engineering training.

The same practice—if anything in more pronounced degree—is occurring with respect to engineering inspection work, by public officials who lose sight of the fact that proper inspection calls for specialized expert service, and that it is a phase of professional engineering. They invite proposals from competing firms for inspection work, with the result that in many instances a firm will quote rates which prevent its performing the service properly, except at financial loss. This may result in loss of the firm's reputation, bringing engineering inspection in general into disrepute and ultimately causing a loss to those retaining the firm, either by passing inferior work, or incurring the expense of replacements and delays. In the aggregate such practice represents losses far exceeding the apparent saving between the low figure submitted and the normal charges of those who endeavor to return a dollar's worth of service for every dollar charged.

In no case does engineering inspection take the place of the work of the consulting engineer, or of the engineer permanently employed by the public body, but supplements both.

Inspection of materials or of construction, when properly and effectively performed, results in:

(a) Adherence to specifications; (b) uniform product, and maintaining of standards; (c) a check on required quality and workmanship; (d) acceptance of material suitable for the service it is to perform; and (e) a stronger legal position for the owner.

It is of record in several of our states, whose state legal authorities have ruled or expressed an opinion, that engineering inspection is in effect professional service, and as such is not subject to competitive bidding. Those who recognize the value of good inspection service, and will obtain it by the methods that the previous article considers proper procedure in securing engineering services, are to be commended.

W. R. CONARD,
Consultant and Engineer, Burlington, N. J.

The Lime-Soda-Ash Process of Water Softening

By **FRANK W. BOUSON**
Chief Chemist, South Pittburgh Water Co., Pittsburgh, Pa.

SINCE 1924, the South Pittsburgh Water Co. has been serving a territory south of the Monongahela and Ohio Rivers, including 14 boroughs, 11 townships and 9 wards of the city of Pittsburgh, with a water supply softened by the lime-soda process to a hardness of 100 p.p.m.

The raw-water supply is taken from the Monongahela River about 500 feet above the entrance of Beck's Run. The watershed which the Monongahela River and its tributaries drain covers a territory of 7,290 square miles, heavily populated, and is an industrial center, with steel and coal as its main products. The large quantity of mine drainage entering the Monongahela River changes its characteristics from an alkaline to an acid state. The effect of this pollution is an increase in hardness which may vary from 35 to 550 parts per million, of which as high as 40 p.p.m. may exist as free, uncombined acid when titrated with methyl orange as the indicator. There are also present in the raw water, owing to this pollution, varying quantities of acid salts of iron and aluminum, which enter into the softening process and carbonization plan which will be described later in this paper. All of the hardness is consequently present as non-carbonate hardness (incrustants) in the form of sulphates, necessitating the use of soda-ash and not lime as the principle reagent in the softening process.

Variation in Process

The lime-soda process as used by the South Pittsburgh Water Co. has been developed to a point of high efficiency to obtain full removal of hardness for the quantity of soda-ash applied. Slight changes have been made in the process since operation of the softening plant started in 1924. These changes were made to make the process more efficient and because of a change in the characteristics of the Monongahela River during the drought of 1930 and early 1931.

The raw water as it is taken from the river by the low-service pumps receives its first treatment of the softening process. Soda-ash is fed in such quantities as practically to neutralize the uncombined mineral acid, leaving from 1 to 2 parts per million free acid present. If additional soda-ash is applied to carry the reaction beyond the exact neutralization of the free mineral acid, the additional soda combines with the acid salts of iron and aluminum in the raw water, lowering its effectiveness as a by-pass water, with the result that the non-carbonate hardness content of the water as it reaches the softening plant varies in proportion to the excess soda added.

As the control of the softening process is based on the non-carbonate hardness content of the water as it reaches the softening plant, any removal by softening these salts before reaching this point is not desired.

This treatment with soda-ash affords a protection to the low-service pumping equipment, including the condensers, pumps and low-service lines to the softening plant. The feeding of soda-ash at this point is accomplished through a dry feed machine, and the quantity fed is controlled by the station attendants trained in making the simple titration tests on samples collected every half-hour from the discharge of the pumps.

From the low-service station the water is pumped to the softening plant, where the split treatment is used to accomplish the complete carbonization of the softened water, with a resulting total hardness of not over 100 parts per million or under 90 parts per million. This treatment consists of dividing the water into two parts as it reaches the softening plant. One part passes through the softening plant, to be softened by the lime-soda method to a predetermined non-carbonate hardness content, and the other part is by-passed into the softened water line conducting the flow from the softening plant to the settling basins of the filter plant. Venturi meters indicate and record the flow through the softening plant and through the by-pass line.

Method of Determining Treatment

For an example, let us assume that we are treating a water which shows by chemical determination a non-carbonate hardness of 200 parts per million, and with a phenophthalein acidity content capable of accomplishing complete carbonization by dilution and chemical reaction when mixed with the softened water in proportions of 30 per cent untreated water to 70 per cent softened water. In order to maintain a standard of between 90 to 100 p.p.m. total hardness in the finished water, it would be necessary to soften the water entering the softening plant to a non-carbonate hardness of 35 p.p.m. The total hardness in a water is equal to the sum of the non-carbonate hardness and carbonate hardness present.

The larger portion of the water which is to pass through the softening plant is first aerated to liberate the carbon-dioxide, thereby effecting a considerable saving in the quantity of lime necessary in the softening treatment. From the aerator tables, the water is conducted to four mixing tanks with a capacity of 100,000 gallons each. These tanks are equipped with motor-driven devices to obtain a thorough mechanical mix of the soda-ash and lime added to the water as it enters the first two tanks, which are operated in parallel. The second pair of mixing tanks are operated in series with the first pair. The flow of treated water is baffled so as to utilize the entire capacity of the tanks and receive the mixing action of the stirring paddles. The speed of these mechanical paddles is such as to promote rapid chemical reaction and the formation of a well-defined floc which will readily settle on reaching a quiescent stage in the clarifier.

The quantity of soda-ash required for the desired re-

moval of non-carbonate hardness is calculated from analyses made at the laboratory of the water to be treated. This calculation is made by using the theoretical removal factor for soda-ash. In softening a water with a non-carbonate hardness content of 550 p.p.m., it would require 29.45 grams per gallon of soda-ash, or 4,211 pounds per million gallons. At the South Pittsburgh plant with a total pumpage amounting to 15 million gallons per day, 63,165 pounds of soda would be required to soften such a water to the standard maintained.

The entire lime-soda-ash process for the removal of non-carbonate and carbonate hardness is based on the insolubility of calcium carbonate. Lime is fed in conjunction with the soda-ash in such quantities as to convert all the alkalinity of the softened water to the normal carbonate form, resulting in a water with a total alkalinity equal to the solubility of calcium carbonate, which is approximately 40 parts per million. A check on this treatment is made every hour to maintain the alkalinity at the caustic point.

During periods when the temperature of the treated water is below 40 degrees Fahrenheit higher alkalinities are experienced, necessitating a further reduction of non-carbonate hardness in order to maintain the standard of 100 p.p.m. total hardness in the effluent.

The type of quicklime used at the South Pittsburgh water-softening plant is known to the trade as "pebble lime." This lime is of such size and quality that it is easily handled by bucket conveyors and possesses the property of slacking quickly and thoroughly.

Settling

From the mixing tanks the treated water with its suspended floc flows to a large settling tank with a conical bottom, 85 feet in diameter, with an average depth of 22 feet. This tank is equipped with a Dorr mechanism for the continuous removal of the sludge. As the water enters the clarifier it is so baffled as to deflect the flow to the bottom of the tank, aiding in the rapid settling-out of the floc resulting from the lime-soda-ash treatment. The Dorr mechanism consists of four arms set radially on a central shaft. Each arm is equipped with plates or plows attached to the arm at an angle of 45 degrees and 10 inches apart. When this mechanical device is slowly rotated, it causes a spiral exertion against the settled sludge, bringing it to the center of the tank, where it drops into a steep cone and is removed by a continuous flow through a small orifice. Water lost in the removal of the sludge from the clarifier averages 0.15 of 1 per cent of the low-service pumpage. About 95 per cent of all the floculant material is removed from the softened water by the clarifier.

The advantages of the clarifier are:

1. It does away with the loss of treated water and expense of cleaning the softening plant basin.

2. The maximum storage capacity of the basin is maintained at all times.

From the clarifier the softened water flows through a large flume constructed across the entire end of the softening plant basin, one side forming a weir over which the water passes to the storage basin. The even distribution of the water entering the basin results in a uniform flow in its passage through the reservoir. The softening plant basin has a capacity of 5 million gallons. The advantage of having a basin of this size is that it gives a long detention period during which time any further softening reactions are completed and final sedimentation of precipitates due to softening by the lime-soda-ash process takes place.

At this point a water is produced with an alkalinity in the form of calcium carbonate averaging 40 parts per million. A water with such a saturation of normal carbonates has several undesirable features:

1. Proper coagulation of the alum added does not take place, owing to the high hydrogen ion concentration.

2. Filtration of such a water through sand filters would destroy the effectiveness of these units, owing to the crystallizing of the normal carbonates on the sand grains, causing their growth and, finally, cementation into areas which are ineffective as a filter medium.

3. The deposition of calcium carbonate would continue throughout the distribution system and service lines, causing a continually lower carrying capacity, due to scale formation.

To overcome these evils, it is necessary to change the alkalinity of the softened water, which exists as normal carbonate, to bicarbonate. This is accomplished by carbonization of the softened supply. At the South Pittsburgh plant this chemical change is brought about by mixing a small portion of raw water with the treated water, the alkalinity of which is due to normal carbonates. The reduction to the bicarbonate form is effected by the chemical reaction of the carbon dioxide and the acid salts of iron and aluminum present in the raw water. These chemical reactions, with the dilution factor of the raw water, result in a mixed water having a considerably lower total alkalinity, present as bicarbonate. The proportions of the mixture are so controlled that the non-carbonate hardness is increased to a point where the total hardness is within the limits of 90 to 100 p.p.m., which is maintained as a standard.

Change of Chemical Characteristics

During the drought period of 1930 and 1931 the raw water changed in its usual chemical characteristics. At this time industrial plants above the intake used the entire flow of the river and treated the acid water with lime to reduce its corrosive action. The majority of this water was used by these plants as cooling water in their various processes and returned to the river after accomplishing its purpose. The treatment of the river water with lime by the industrial plants was carried to such a point as to lessen its effectiveness as a by-pass water. To overcome this condition and properly carbonate the softened water during such periods, a carbonization plant utilizing carbon-dioxide generated by burning natural gas is being constructed at the South Pittsburgh plant. Carbon-dioxide as a carbonization medium will be used only when necessary and in conjunction with the split treatment in order to accomplish the desired reactions and maintain the total hardness at 100 p.p.m.

Just before the mixed water reaches the 5-million-gallon sedimentation basin at the filter plant, a dosage of alum at the rate of 0.50-grain per gallon is injected into the line. This results in a further reduction of alkalinity and furnishes a water with a hydrogen ion concentration of approximately 6.9, which was found by experiment to be the optimum point for the coagulation of the iron and aluminum found in the raw water. Although fully precipitating at a hydrogen ion concentration of 6.9, the aluminum present in the raw water does not produce a

true alum floc. Thus in order to prepare the softened water properly for filtration, 0.50-grain per gallon of alum is added. The alum dosage being constant, the optimum point is maintained in the mixed water by varying slightly the proportion of acid raw water added through the by-pass. Complete precipitation and settling-out of the aluminum found in the raw water before filtration is essential in order to eliminate many filter troubles. If water not so controlled and having a hydrogen ion concentration of above 7.0 is allowed to pass to the filters for filtration, a lower pH in the effluent is experienced, with a corresponding precipitation of a part of the aluminum throughout the sand and gravel beds. This precipitated aluminum has the property of adhering to the sand and gravel and is not removed by the ordinary filter washing. The accumulation of aluminum would continue until the gravel became impregnated to such a point as to cause an uneven flow of wash water during the washing process. A serious displacement of the gravel would result, necessitating a complete overhauling of the filters. A high-velocity wash with a 20-inch vertical rise per minute, requiring approximately 2.0 per cent of the total amount of water filtered, is used in washing the filters.

By maintaining a softened water completely carbonated and efficiently precipitating the aluminum present in the raw water, the 24 rapid sand filters of the South Pittsburgh plant have been kept in good condition, without overhauling, during the past three and one-half years.

The filter effluent having a hydrogen ion concentration of 6.9 with a total alkalinity averaging 17 parts per million may cause red water trouble in the distribution system. To reduce the corrosive properties of the filtered water, an application of soda-ash in sufficient quantity is made to produces an effluent having a hydrogen ion concentration of approximately 8.0.

Soda-ash instead of lime is used in this treatment because of its solubility and chemical reaction. The effect of this application is a reduction of the non-carbonate hardness with a corresponding increase in the carbonate hardness of the effluent. Therefore no adjustment of the softening process is necessary to obtain the desired increase in total alkalinity.

Sufficient chlorine is applied at the suction of the high-service pumps to satisfy the chlorine demand and to carry a residual of 0.20 p.p.m. in order to sterilize the effluent.

Laboratory Control

Laboratory control over the entire process is maintained twenty-four hours a day. Samples of water are taken every four to six hours before and after each phase of the softening treatment, for analysis of the non-carbonate hardness content.

Alkalinities are determined on the samples in the laboratory as a check on the hourly tests made by the operators. Log sheets at the softening plant and at the filtration plant are kept, giving in detail the hourly results of operation.

Softening of the water by the lime-soda process to 100 p.p.m. at the South Pittsburgh plant, using the treatment as outlined, produces a very satisfactory water, the total hardness of which is due to 75 p.p.m. non-carbonate hardness and about 25 p.p.m. carbonate hardness. The type of water produced does not have either corrosive or incrusting properties.

ACKNOWLEDGMENT.—From a paper read before the Pennsylvania Water Works Operators' Association.

When Customers Complain of the Quality of the Water— What Then?

By EDWARD C. TRAX
Chemist and Bacteriologist,
McKeesport, Pa.

THE quality of the water furnished to any community depends to a very considerable extent upon the available sources of supply. In these days of advanced processes of purification, any supply can be greatly improved, and in appearance, bacterial condition and hardness can be made entirely satisfactory, but there are no rational or economical methods of restoring a chemically polluted water to a state of pristine purity.

There are some ground water supplies in Pennsylvania, but in most parts of the state wells fail in respect to quantity or quality or both. For the most part, surface waters are the only available sources of supply, and in the industrial and mining regions these waters are often badly polluted with chemical wastes and require extensive and expensive purification. Although there is room for improvement in many cases, the purification plants are in general properly operated, and the water furnished is as good as is economically possible under the circumstances. The nature of some of the polluting substances is such that they cannot always be entirely removed, and for these and other reasons complaints as to the quality of the water are most numerous in these regions.

Classes of Consumers' Complaints

There are two general classes of consumers' complaints —those which are justified, and those which are not. There is, perhaps, no sharp line of division. From the standpoint of investigation and handling, I do not believe there should be any difference in the procedure, but the unjustified ones are usually the more difficult to explain to the satisfaction of the consumer. The most difficult of all are those due to ignorance, superstition and imagination. Many people are ready to blame all their aches, pains, and ills on the city water, even when these physical ills are of opposite natures. Skin eruptions are usually

blamed on the water. During an influenza epidemic a number of years ago, several people reported that they believed it was caused by the water. These and similar complaints fall to the lot of the superintendent and are taken by all water-works men as part of the day's work. Shining examples of unjustified complaints are those made in a small town furnishing a supply which varies in hardness from 20 to 35 parts per million. There are more complaints in regard to the hardness of the water in that town than in any other place with which I am familiar.

A Medal and Everlasting Gratitude

For any one who can originate a method of satisfying every consumer who makes a complaint with regard to the quality of the water, there awaits a medal engraved with the everlasting gratitude of all the water-works men in the world. There is no royal road to such satisfaction. We wish that all complaints could be handled somewhat as follows:

The water-works superintendent is called to the telephone and the following conversation ensues:

Consumer: Good morning, Mr. Superintendent. Pardon me for troubling you with this trivial matter. I am probably wrong about it, but it seems to me that there is a slight unpleasant taste in the city water this morning.

Superintendent: Why, Mr. Consumer, I am astonished that any one should complain about our crystal product. It is always so pure and tasteless that we have not had a single complaint for years. Surely you must be mistaken.

Consumer: Oh, thank you so much. I am sure now that I am wrong about it. It must be my imagination or the rarebit I ate last night. Good-bye, and I am very, very sorry to have troubled you.

Conversations like this are like the story of the rich unknown uncle dying in South America and leaving you a million dollars. It simply does not happen.

Get the Jump on Complaints

The best method of handling complaints about poor quality should begin five or ten years before the complaint is made. If the relations between the water utility and the consumer have been cordial for a number of years, it is vastly easier to bring about some sort of amicable understanding. In late years a great deal of attention has been directed toward the best methods of establishing these relations. In regard to water quality, I believe that pleasant relations can be best accomplished by encouraging the consumer to have a better understanding of the processes and difficulties of purifying and furnishing the water. Make the consumer always a welcome guest at the water plant. Have some employee ready to show him through the plant in a courteous and friendly manner, encourage grammar and high school classes to visit the plant, explain to them how the water is made pure, and above all things emphasize safety.

Safety for drinking purposes is the most important quality of a public supply and is nowadays a primary requirement. It is also the matter most frequently overlooked by the consumer. It is always a good talking point. Most people do not realize the difficulties encountered in furnishing water and are not greatly interested in them, but if the water-works superintendent can get this across to a class of school children, the information, to some extent, at least, will be carried home to every family. I have seldom shown a lay visitor through a water plant without hearing an expression of surprise at the complexity and difficulty of the process. A common remark is, "Why, I had no idea you went to all this trouble. There is more to it than I thought."

Investigating Complaints

A polite, frank and sincere explanation of the nature of the defect in the supply causing the complaint, while it does not always satisfy the consumer, at least impresses him and leaves him with the idea that, after all, the water utility is doing the best it can. There are exceptions, of course, which include consumers with some real or imaginary grievance; and others who for selfish or political reasons are unfriendly. These are hopeless cases and just have to be considered a total loss. Even in these cases the water official cannot afford to lose his temper and get into a quarrel.

I do not think that the consumer should always be considered in the right, but a certain amount of patience and humility is a valuable asset. An outstanding example of the unreasonable consumer is found in a community in western Pennsylvania where one of the principal sports for many years has been the baiting of the water company. One of the consumers, when asked about the quality of the water, said, "It has a terrible taste and is terrible in every way." When asked if it had not somewhat improved in the last few weeks, he declared, "Why I haven't tasted it for months. I wouldn't drink it even if it was good." A merchant in this town who merely stated on the witness stand that he thought the water had improved and that recently he had not noticed anything wrong with it, lost many customers even among his friends, so bitter and unreasonable is the feeling against the company.

Civic Pride Helps the Municipal Plant

The McKeesport, Pa., water works are municipally owned, but this does not make any difference in the number of complaints or the method of handling the water. The people of McKeesport, however, are very well pleased with the water supply. There are a number of people who firmly believe that McKeesport has the best water plant and best water supply in the country. This may be partly civic pride and partly because they are accustomed to the water furnished, but the feeling does exist to a remarkable degree. The people have been taught that the water supply is first class, which is true, and there are few communities that are better satisfied with the public water supply. There are complaints, however, and I must admit that occasionally they are justified; they include the usual list—hardness, corrosion, taste, odor, muddy water, physiological effects such as itches, rashes, infections and various sicknesses and diseases. In fact, almost every ill to which human flesh is heir has at one time or another been blamed on the water.

It is the policy in McKeesport to investigate every complaint, however unjustified or unreasonable. When a complaint regarding quality is made we usually go directly to the consumer's home, get the story and take a sample of water for some simple tests such as hardness, alkalinity, chlorides, residual chlorine, etc., which are usually made right on the premises with a portable testing set provided for this purpose. Samples for bacterial examination and additional chemical tests are also collected and a report of the results of the tests, together with such explanation of the causes of the complaint as can be made, is furnished

the consumer. He is assured that the water is entirely safe to drink and use. These tests usually do not mean much and do not always satisfy the consumer, but they at least show him that we are interested in furnishing as good water as possible and are probably doing the best we can.

Frequently, analyses of the water, with comments and assurances of the safety of the supply, have been carried in the newspapers as paid advertising. This is nothing new, of course, but in the case of small towns where everybody reads the local paper, it has been found quite effective.

During the drought of 1930, practically every water supply in the drought area was affected in regard to quality. The Monongahela River, in common with other streams, especially in the coal mining regions, was much worse in quality than at any other time in its history, and the quality of the water furnished communities using the river as a source of supply was the cause of considerable complaint, much of which was justified. There were, however, a few bright spots in the general gloom of this period. In a crowded elevator in McKeesport one day an acquaintance was twitting me about the "bad city water." A stranger in the back of the car spoke out: "I think our water is fine under the circumstances and I think our people deserve a great deal of credit for supplying as good water as we have now." One of our consumers called me several times during the last fall complaining about the hardness, taste, and general unsuitability of the water, and wanted to be assured that it was safe to drink and use. Later in the winter, after the drought was over, she called again and said, "I complained several times about the water last fall and I just wanted to tell you that the water now is just fine and couldn't be any better."

It is apparent to all of us that there can be no uniform or standard method of handling all complaints. Different types of consumers require different forms of investigation and explanation. Psychology should enter largely into the curriculum and training of any water-works officials to whose lot may fall the handling of complaints. In general, I believe courtesy, frankness, fairness, and truthfulness with certain reservations, constitute the best policy.

ACKNOWLEDGMENT.—From a paper presented before the Pennsylvania Water Works Association.

Take the Water Works to the Fair

By **HARRY HARDINGE**
Chief Engineer, Board of Public Affairs, Hillsboro, Ohio

THE last day of September and the first three days of October, 1931, were eventful in the history of Hillsboro, and particularly in the history of its water works. These four days were the dates of the annual Fall Festival, in which previous to last year the water works had had no part. In 1931, however, it was decided to experiment a little, and the Water Department purchased a booth for display purposes, although at the time it was not known just what would be exhibited.

The Chief Engineer of the Hillsboro Board of Public Affairs communicated with the Mueller Co., at Decatur, Ill., and although the company had never received a question like this before, it cooperated splendidly by making up a display composed entirely of water-works products, to which were added the tapping machine and several other items in constant use in the Department.

The Buffalo Meter Co. also became interested in this new activity of the Hillsboro Water Department. It furnished a glass-cased meter and asked its Cleveland representative to be on hand with several larger sizes of meters. The representative was of great assistance, and the success of the exhibit was due in large measure to the cooperation that was furnished by these two companies.

At first it was thought that a fountain would be installed in the booth and would prove attractive, and the rate of flow could be shown in the glass-cased meter. On second thought, it was decided to install a faucet, for the reason that the general public are better acquainted with faucets and with it they could see just how much water they wasted when the faucet was turned on and also how the meter registers water from the dripping faucet.

The Chief Engineer was in attendance all four days of the Festival and never put in four busier ones in his life. The two men in attendance answered questions from morning to night.

The exhibit was a success from another standpoint also. It offered an exceptional opportunity for the Water Department to learn in a general way just what the public expected of their water works, and what they thought of its principles and operations.

THE WATER DEPARTMENT BOOTH AT THE ANNUAL FALL FESTIVAL AT HILLSBORO, OHIO

Municipal Improvements in the Capital City of Mississippi

Paving—Financing Street Work and Unemployment Relief—Public Buildings and Their Surroundings—Municipal Airport Layout

THE oldest paved street in Jackson, Miss., at present in use with the original pavement is a brick pavement laid in 1898. It has a concrete base of varying thickness, and the brick are laid in cement grout. Some years ago it was resurfaced with a thin blanket of asphalt, but that has worn off and the original pavement is still doing its bit to carry the much heavier traffic of today.

Most of the business district was originally paved with wood blocks, but, owing to flooding in the old days, the blocks swelled, heaved and were washed down to the Negro section of the city, where they provided firewood for many a winter. These blocks were replaced with brick, a block at a time, as rapidly as money was available for this improvement.

Perhaps the outstanding piece of experimental paving in the city is a stretch of asphaltic concrete on a base of 6-inch concrete and 3-inch sand cushion. The section where this was done had caused considerable trouble with the marl, which literally "crawled" beneath the pavements which had been laid and caused the surface to break up. Marl will actually increase in bulk when excavated and exposed to the air, hence utility excavations provided more than the usual amount of trouble in this section. On the experimental section, which was two blocks long, a 6-inch slab of 1:2:4 concrete reinforced with 50-pound mesh at the top and ½-inch rods on 3-foot centers and 12-inch concrete beams on 12-foot centers was laid as a foundation on a 3-inch sand cushion. It is possible to dig under this pavement and crawl through from one side to the other of the slab with perfect safety, but the cost of such a base is prohibitive and its use was not continued after the experimental section.

At present the city is using a monolithic curb, gutter and concrete base for the streets. These carry a 2-inch asphaltic concrete pavement similar to a Topeka mix.

Paving Assessments

For a long period the city assessed all new paving against the abutting property owners on the basis of one-third of the street cost paid by the city, and one-third by each of the properties on facing sides of the street. The

A GARDEN REPLACES UNSIGHTLY STRUCTURES IN FRONT OF THE CITY HALL, JACKSON, MISS.
The 100-year old City Hall, and in the center the new Hinds County Court House, both face on the formal gardens. Unlimited parking is permitted on the streets within the marked areas, but only city cars are permitted on the roadway passing in front of the City Hall

city also paid for all intersections. A careful analysis of the spread of these assessments showed that the city was actually paying for more than 50 per cent of the paving out of the general funds, and the abutting properties which were benefited were paying less than one-half the cost. This ratio was changed by a new law having the abutting property pay for one-half the width of the street, and the city pay only for the intersections from the general funds.

Unemployment Relief

Like many other cities throughout the country, Jackson has tried to do all possible to relieve the unemployed through giving useful work. The financing of this work has always been a problem. It was solved in Jackson by seeking a fund from all employed citizens on the basis of one cent of every dollar earned. The fund secured in this manner amounted to $26,000 and has been expended chiefly in the parks, where the work could be done reasonably economically with hand labor. During the winter months more than 6,000 men were given two days' work each week under this project.

Municipal and County Buildings

An interesting contrast in architecture is found at Jackson, Miss., where the new County Building, designed in the modern manner, is situated side by side with the ancient City Hall. The latter building is of classic design and has been in constant use as a municipal building for nearly one hundred years. (See the front cover of this issue.) Though the building itself stands practically as it was originally designed, it has looked out over many changes in its surroundings. The flower garden shown in the accompanying illustration was, until a few years ago, the site of the old city stables, the original and very smelly city jail, and a smoke-belching artificial gas manufacturing plant—a combination that was hard to beat for unsightliness and insanitation. In four years these unlovely institutions have been replaced by this garden, which contains thirty thousand plants and is a mass of continuous bloom twelve months every year.

A SECTION OF THE LAST BLOCK OF WOOD BLOCK PAVING IN JACKSON, MISS.
Patches of both brick and asphalt are shown

The Municipal Airport

The new municipal airport in Jackson is now on the routes of two transcontinental air lines, the New Orleans to Chicago line, and the Atlanta to Los Angeles route, both operated by American Airways. The city is served by four mail planes a day. The airport has an area of 160 acres and is a rolling terrain, all turf and with no runways, thus making it an all-way landing field. It has an administration building with a small restaurant, rest rooms and other accommodations. The all-steel hangar measures 80 x 100 feet, and American Airways also has an administration building.

The Federal Government Weather Bureau and the Department of Commerce each have weather-observing stations, and one of them broadcasts from a point near the field. The name "Jackson" is painted in letters from 15 to 20 feet high on the roofs of five buildings as well as on the hangar. The field is not lighted for night landing.

Since the field first opened, it has been enlarged twice by the removal of large wooded areas at the edges, and has been leveled somewhat by the removal of a large yardage of dirt from the knolls. Operation of the field is under direction of City Engineer J. J. Halbert.

More, Not Less, Municipal Recreation Work Needed

WARNING that curtailment of recreational activities—both those financed by the city and those provided by privately supported organizations—will have serious consequences in the character of boys and girls now growing up in idleness and that "this will be reflected in the moral standards of the community as a whole" is contained in a resolution adopted June 15 by the City Recreation Committee of the Welfare Council of New York City, which is composed of practically all the non-commercial recreational agencies in the city.

"Although we realize the necessity for economy in the city budget," declared the resolution, "and the need for meeting vital calls on the city treasury for relief in food and shelter for destitute citizens, yet we believe that keeping up the morale and saving children from the inevitable consequence of idleness are also of the greatest importance.

"Due to unemployment, thousands of young people who otherwise would be working are now idle, and it is our belief that this idle time, unless utilized in some constructive manner, will be of greatest menace to their developing characters, with disastrous results at present and in the future, to the individual and to the community.

"Many privately organized agencies providing recreation facilities for young people have had to abridge their work because of lack of funds and in some instances to cease altogether, and therefore an increased burden will be placed in the municipal facilities. There are indications of serious curtailment in the recreational budgets of the various city departments, both for the current year and for the year 1933."

Commenting on this situation, Pearl Bernstein of the League of Women Voters said, "The rescinding of municipal appropriations for recreation facilities represents not real economy, but the squandering of human welfare."

Similar sentiments were voiced by Owen Lovejoy, secretary of the Children's Aid Society, Mrs. V. G. Simkovitch, director of Greenwich House and chairman of the City Recreation Committee, and by Lee F. Hanmer, director of the department of recreation of the Russell Sage Foundation.

Addressing the annual meeting of this section of the Council on "Recreation and Unemployment," John Erskine said, "Not only the problem of crime and the problem of gangsters, but the whole problem of successful living would be solved to some extent by more recreation of the proper sort."

Using Common Sense in the Tax-Saving Crusade

THAT genuine reductions in American governmental costs will not be made by alarmists in a panic, but by careful examination of the underlying difficulties, was the theme of a recent convocation address* at the University of Minnesota, by Charles E. Merriam, Professor of Political Science of the University of Chicago. Answering the question, "How shall governmental costs be reduced?", Dr. Merriam said in part:

"Many of the answers recently proposed are more dangerous than the evils they propose to cure. To abolish or to cripple health departments, to abolish nurses' training schools, to close the high schools, to lay off policemen and firemen—these and other like types of changes seriously proposed are likely to do incalculable injury of a permanent sort. . . .

"To close the high schools, knowing what we do about the danger of criminality in this critical period, would be the greatest possible incentive to the growth of crime for a generation. To reduce the strength of health departments, to cut down the facilities for recreation in a period of depression like this, is to invite the most serious trouble, now and for a long time in the future. In short, the hysterical mood is not the one most favorable to wise and far-seeing readjustments of governmental expenditure. I confess to a very genuine alarm at the activities of some well-intentioned citizens who are carrying on a crusade against high costs—sincerely, but, as it seems to me, destructively. In the old days out in the country when a fire broke out, there was sometimes as much damage done by the amateur fireman as by the flames themselves."

Among the definite suggestions offered by Dr. Merriam for beneficial economies, were the abolition of the spoils system; encouragement of the organization and training of responsible governing officials; and reorganization of governmental units and departments in such a manner as to prevent the great wastes of overlapping and duplication. In regard to the last-mentioned, the speaker said:

"In ordinary times, it is extremely difficult to take even the slightest step toward reorganization of these conflicting units of government, but in a time of depression when more than usual pressure can be exerted, it might be found possible to progress more rapidly. For at this time the vested interest of the local magnate or politician may be borne down by the imperative demand of the taxpayer and the citizen for some important use of his available funds.

"If the taxpayers cannot overcome the appetites of the local bosses and bosslets now, in time of deepest need, when will there ever come a more favorable time? Are not funds for health, education, public safety, relief of unemployment, more important than funds for keeping up a set of antiquated and duplicating governmental units?"

Especially dangerous, in Dr. Merriam's opinion, is the present widespread and vociferous propaganda against governmental services throughout the United States:

"There is no one, with the exception of the professional anarchist, who really wishes to be entirely rid of organized government. But the attiude of many persons who are now carrying on a crusade against waste in governmental expenditures is exactly the same as that of those who are against all government. And consequently, while they are lopping off a dollar of expenditures here and there, they are at the same time increasing the costs of all government in the long run enormously by their bitter and unreasoning criticism of all governmental activities. . . .

"Hurried hacking at budgets with dull axes in inexperienced hands will not take the place of scientific planning in terms of modern science and modern social ideals, conducted by America's greatest talent. Nor must we forget, as a nation in a world of nations, the old truth that 'No man liveth unto himself.'"

* Available as a reprint from *Minnesota Municipalities*, May, 1932 (University Library, Minneapolis).

Residential Electric Rates in Cities of Over 50,000

A VERY practical and useful comparison of charges for electricity for residential service in the 190 cities having over 50,000 population has been prepared under the direction of George W. Page, City Commissioner, Trenton, N. J., by Otto P. Ortlieb, Engineer of Street Lighting. THE AMERICAN CITY is glad to present this information herewith. Instead of giving the rate schedules, which are so diverse as to make direct comparison unsatisfactory, the costs to the consumer of definite monthly quantities of electrical energy for a definite type of house have been computed and tabulated, under date of April, 1932. Explaining his procedure, Mr. Ortlieb says:

All cities above 50,000 in the 1930 census are included in this report. The information on rates was secured from the printed rate sheets or bill forms of the utility companies in practically all cases.

The monthly charges in this report are for the electricity used for ordinary domestic purposes in a seven-room house (living room, dining room, kitchen and four bedrooms), having an inside area of 1,400 square feet (outside area 1,555 square feet), with the bills paid promptly to secure the discount, if any.

An electric refrigerator is included in the connected load for the 80- and 100-kilowatt-hour per month steps, and the proper rate is used. In the cases where a separate meter is necessary to secure a refrigerator rate, it is assumed that in the 80-kwh step, 40 kwh are used by the refrigerator, and in the 100-kwh step, 50 are used by the refrigerator.

The connected load of the lamps in service is 500 watts for 20 kwh and under, 600 watts for 30 kwh, 700 watts for 40, 800 watts for 50, 900 watts for 80, and 1,000 watts for 100 kwh.

Where more than one rate is available for residential service, it is assumed that the lowest rate for each step is applied, subject to the regulations of the individual companies. This is the usual practice.

There is considerable variation in the charges in the various cities. It does not seem likely that rates based on accurate cost analysis should differ as much as shown in this report. Even in comparing steam and hydro systems the difference should be only 3 to 5 mills per kilowatt-hour to cover the cost of fuel.

This information was secured during an investigation which is being made on the rates in Trenton. It is hoped that it will be of value to other municipalities interested in rates for residential service.

In addition to the averages shown on the opposite page for the entire group of 190 cities, the following averages are of interest. It should be particularly noted that for each quantity of electricity used the average charge of the municipal plants* was much less than that of the private-company plants.

	Kilowatt Hours Used per Month							
	0	10	20	30	40	50	80	100
Average 13 cities above 500,000	$ .63	$ .76	$1.27	$1.78	$2.23	$2.60	$3.57	$4.19
Average 28 cities 200,000 to 500,000	.73	.90	1.44	2.07	2.63	3.13	4.28	4.99
Average 52 cities 100,000 to 200,000	.81	.90	1.47	2.13	2.74	3.32	4.44	5.20
Average 33 cities 70,000 to 100,000	.83	.97	1.59	2.23	2.78	3.25	4.40	5.13
Average 27 cities 60,000 to 70,000	.80	.96	1.66	2.33	2.92	3.47	4.58	5.28
Average 37 cities 50,000 to 60,000	.77	.95	1.58	2.20	2.77	3.30	4.43	5.16
Average 13 cities with municipal plants	$ .55	$ .62	$1.07	$1.57	$2.00	$2.36	$3.33	$3.98
Average 177 cities with private plants	.80	.94	1.56	2.20	2.77	3.31	4.45	5.17

* Mr. Ortlieb has given figures for only one company or system in each city, and thus has not included the municipal systems of Cleveland, Ohio, and Ft. Wayne, Ind., or the private company in Columbus, Ohio. He has since furnished these and they are given below:

Columbus (private)	.50	.60	1.20	1.80	2.40	3.00	4.50	5.50
Cleveland (municipal)	.75	.75	.90	1.20	1.50	1.80	2.70	3.30
Fort Wayne (municipal)	.50	.50	1.00	1.50	2.00	2.50	3.80	4.60

	Kilowatt-hours used per month							
	0	10	20	30	40	50	80	100
Bridgeport, Conn.	$1.00	$1.00	$1.05	$1.58	$2.10	$2.63	$4.20	$5.25
Hartford, Conn.	.70	1.20	1.70	2.20	2.70	3.20	3.80	4.40
New Britain, Conn.	1.00	1.00	2.00	2.46	2.86	3.26	4.46	5.26
New Haven, Conn.	1.00	1.00	1.05	1.58	2.10	2.63	4.20	5.25
Waterbury, Conn.	1.00	1.00	2.00	2.46	2.86	3.26	4.46	5.26
Portland, Maine	1.00	1.00	1.60	2.31	2.81	3.31	4.81	5.91
Boston, Mass.	.75	.75	1.50	2.05	2.55	3.05	4.55	5.39
Brockton, Mass.	.75	.80	1.60	2.10	2.50	2.90	3.95	4.65
Cambridge, Mass.	0	.55	1.10	1.65	2.20	2.56	3.46	4.06
Fall River, Mass.	.50	.80	1.60	2.25	2.75	3.25	4.75	5.75
Holyoke, Mass.	.50*	.50*	.80*	1.20*	1.60*	2.00*	3.20*	4.00*
Lawrence, Mass.	.75	1.00	1.94	2.44	2.94	3.44	4.64	5.44
Lowell, Mass.	.75	1.17	1.87	2.57	3.17	3.77	4.90	5.60
Lynn, Mass.	.75	.75	1.30	1.88	2.38	2.88	4.38	5.38
Malden, Mass.	.50	.85	1.70	2.49	3.04	3.59	4.76	5.46
Medford, Mass.	.50	.85	1.70	2.49	3.04	3.59	4.76	5.46
New Bedford, Mass.	.75	.76	1.38	1.85	2.33	2.80	3.88	4.35
Newton, Mass.	.75	.75	1.50	2.05	2.55	3.05	4.55	5.39
Quincy, Mass.	.50	.75	1.50	2.25	2.88	3.38	4.80	5.40
Somerville, Mass.	.75	.75	1.50	2.05	2.55	3.05	4.55	5.39
Springfield, Mass.	.67	.67	1.10	1.65	2.20	2.75	3.90	4.95
Worcester, Mass.	.75	.75	1.00	1.50	2.00	2.50	3.80	4.40
Manchester, N. H.	1.00	1.00	2.00	2.88	3.48	4.08	5.36	6.16
Pawtucket, R. I.	1.00	1.00	2.00	3.00	3.75	4.25	5.75	6.75
Providence, R. I.	.50	.96	1.61	2.26	2.91	3.56	5.08	5.81
Average 25 cities New England states	.73	.86	1.52	2.13	2.65	3.15	4.44	5.22
Atlantic City, N. J.	1.00	1.00	1.80	2.70	3.60	4.50	4.90	5.60
Bayonne, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Camden, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
East Orange, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Elizabeth, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Hoboken, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Irvington, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Jersey City, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Newark, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Passaic, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Paterson, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Trenton, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Union City, N. J.	1.00	1.00	1.80	2.60	3.40	4.10	5.00	5.60
Albany, N. Y.	1.00	1.00	1.60	2.40	3.00	3.30	4.20	4.80
Binghamton, N. Y.	1.30	1.30	1.80	2.50	2.90	3.30	4.50	5.30
Buffalo, N. Y.	.75	.75	.95	1.35	1.75	2.03	2.48	2.78
Mount Vernon, N. Y.	1.00	1.00	1.95	2.90	3.85	4.80	7.15	8.40
New Rochelle, N. Y.	1.00	1.00	1.95	2.90	3.85	4.80	7.15	8.40
New York, N. Y.	1.00	1.00	1.55	2.05	1.55	1.05	4.55	5.55
Niagara Falls, N. Y.	.75	.75	.95	1.35	1.75	2.03	2.48	2.78
Rochester, N. Y.	1.00	1.00	1.60	2.40	2.85	3.25	4.45	5.25
Schenectady, N. Y.	1.00	1.00	1.60	2.40	3.00	3.30	4.20	4.80
Syracuse, N. Y.	1.20	1.20	1.50	2.10	2.40	2.70	3.60	4.20
Troy, N. Y.	1.00	1.00	1.60	2.40	3.00	3.30	4.20	4.80
Utica, N. Y.	1.00	1.00	1.50	2.25	2.75	3.25	4.75	5.75
Yonkers, N. Y.	1.00	1.00	1.60	2.40	3.20	4.00	6.20	7.00
Allentown, Pa.	1.00	1.00	1.80	2.60	3.40	4.15	5.30	6.00
Altoona, Pa.	1.00	1.00	1.60	2.22	2.84	3.46	5.08	6.20
Bethlehem, Pa.	1.00	1.00	1.80	2.60	3.40	4.15	5.30	6.00
Chester, Pa.	.75	.80	1.44	2.04	2.64	3.15	4.08	4.68
Erie, Pa.	.71	.81	1.62	2.42	3.23	4.04	5.18	5.94
Harrisburg, Pa.	1.00	1.00	1.80	2.60	3.30	4.00	5.00	5.70
Johnstown, Pa.	1.00	1.00	1.80	2.70	3.10	3.40	4.30	4.90
Lancaster, Pa.	1.00	1.00	1.80	2.60	3.30	4.00	5.00	5.70
McKeesport, Pa.	.50	.80	1.55	2.10	2.65	3.20	4.18	4.78
Philadelphia, Pa.	.75	.75	1.35	1.95	2.55	3.09	3.99	4.89
Pittsburgh, Pa.	.50	.80	1.35	1.90	2.30	2.70	3.70	4.30
Reading, Pa.	1.00	1.00	1.80	2.70	3.40	4.10	5.30	6.00
Scranton, Pa.	1.00	1.00	1.60	2.40	3.00	3.60	4.40	5.00
Wilkes-Barre, Pa.	1.00	1.00	1.80	2.60	3.30	4.00	5.00	5.70
York, Pa.	1.00	1.43	1.90	2.38	2.76	3.14	4.09	4.66
Average 41 cities Middle Atlantic	.96	.99	1.67	2.42	3.08	3.68	4.75	5.43
Chicago, Ill.	.50	.70	1.40	1.92	2.42	2.76	3.86	4.26
Cicero, Ill.	.50	.80	1.60	2.38	3.08	3.78	5.40	6.08
Decatur, Ill.	.75	.75	1.20	1.80	2.35	2.85	4.15	4.75
East St. Louis, Ill.	.50	.67	1.33	2.00	2.49	2.73	3.44	3.91
Evanston, Ill.	.50	.80	1.60	2.38	3.08	3.78	5.40	6.08
Oak Park, Ill.	.50	.80	1.60	2.38	3.08	3.78	5.40	6.08
Peoria, Ill.	.75	.90	1.56	1.98	2.28	2.58	3.48	4.08
Rockford, Ill.	1.00	1.00	1.60	2.16	2.66	3.04	3.94	4.54
Springfield, Ill.	.50*	.60*	1.20*	1.80*	2.10*	2.40*	3.30*	3.90*
East Chicago, Ind.	1.00	1.00	1.80	2.35	2.75	3.15	4.35	5.15
Evansville, Ind.	1.00	1.00	1.35	2.03	2.70	3.38	4.04	4.78
Fort Wayne, Ind.	.60	.50	1.00	1.50	2.00	2.50	3.80	4.60
Gary, Ind.	1.00	1.00	1.44	2.16	2.70	3.24	4.50	5.22
Hammond, Ind.	1.00	1.00	1.80	2.35	2.75	3.15	4.35	5.15
Indianapolis, Ind.	.80	.80	1.30	1.95	2.60	3.25	4.22	5.20
South Bend, Ind.	1.00	1.00	1.50	2.25	2.95	3.65	4.60	5.60
Terre Haute, Ind.	.75	.75	1.40	2.08	2.73	3.38	5.33	6.63
Dearborn, Mich.	.50	.85	1.21	1.57	1.93	2.29	3.09	3.54
Detroit, Mich.	.50	.85	1.21	1.57	1.93	2.29	3.09	3.54
Flint, Mich.	.50	.90	1.50	1.98	2.46	2.94	3.81	4.47
Grand Rapids, Mich.	.50	.90	1.50	1.98	2.46	2.94	3.81	4.47
Hamtramck, Mich.	.50	.85	1.21	1.57	1.93	2.29	3.09	3.54
Highland Park, Mich.	.50	.85	1.21	1.57	1.93	2.29	3.09	3.54
Jackson, Mich.	.50	.90	1.50	1.98	2.46	2.94	3.81	4.47
Kalamazoo, Mich.	.50	.90	1.50	1.98	2.46	2.94	3.81	4.47
Lansing, Mich.	.40*	.50*	1.00*	1.45*	1.85*	2.25*	2.85*	3.25*
Pontiac, Mich.	.50	.85	1.21	1.57	1.93	2.29	3.09	3.54
Saginaw, Mich.	.50	.90	1.50	1.98	2.46	2.94	3.81	4.47
Akron, Ohio	.50	.80	1.45	1.95	2.45	2.95	4.05	4.65
Canton, Ohio	1.00	1.00	1.50	2.25	2.85	3.45	4.50	5.40
Cincinnati, Ohio	.75	1.20	1.70	2.20	2.70	3.04	3.94	4.84
Cleveland, Ohio	.75	.75	1.00	1.50	2.00	2.40	3.60	4.40
Cleveland Heights, O.	.75	.75	1.00	1.50	2.00	2.40	3.60	4.40
Columbus, Ohio	.50*	.50*	1.00*	1.50*	2.00*	2.50*	4.00*	5.00*
Dayton, Ohio	.50	.70	1.40	2.10	2.65	3.23	4.85	5.45
Hamilton, Ohio	.60*	.65*	1.20*	1.75*	2.30*	2.85*	4.50*	5.60*
Lakewood, Ohio	.75	.75	1.00	1.50	2.00	2.40	3.60	4.40
Springfield, Ohio	.50	.80	1.60	2.40	2.90	3.40	4.30	4.90
Toledo, Ohio	$1.00	$1.00	$1.50	$2.00	$2.50	$3.00	$4.20	$4.90
Youngstown, Ohio	.52	.57	1.14	1.71	2.28	2.85	4.56	5.70
Kenosha, Wisc.	.50	.71	1.43	2.14	2.68	2.96	3.82	4.39
Madison, Wisc.	.75	.75	1.15	1.70	2.01	2.32	3.36	3.87
Milwaukee, Wisc.	.50	.62	1.24	1.86	2.34	2.62	3.48	4.05
Racine, Wisc.	.60	.71	1.43	2.14	2.68	2.96	3.82	4.39
Average 44 cities East North Central	.64	.81	1.36	1.93	2.43	2.89	3.87	4.47
Cedar Rapids, Iowa	.75	1.05	1.75	2.22	2.70	3.17	4.60	5.55
Davenport, Iowa	.50	.90	1.60	2.40	2.99	3.49	4.71	5.31
Des Moines, Iowa	.75	.75	1.14	1.71	2.23	2.76	4.32	4.99
Sioux City, Iowa	1.00	1.00	1.80	2.70	3.60	4.00	5.50	6.50
Kansas City, Kans.	.75*	.75*	1.25*	1.75*	1.95*	2.12*	2.72*	3.17*
Topeka, Kans.	.50	.65	1.30	1.95	2.60	2.95	4.15	4.75
Wichita, Kans.	1.30	1.30	1.42	1.82	2.22	2.62	3.82	4.62
Duluth, Minn.	.25	.60	1.20	1.80	2.40	3.00	3.91	4.31
Minneapolis, Minn.	1.00	1.00	1.52	2.24	2.80	3.09	3.94	4.81
St. Paul, Minn.	1.00	1.00	1.71	2.44	2.89	3.18	4.03	4.91
Kansas City, Mo.	.50	.65	1.30	1.95	2.60	2.95	4.10	4.60
St. Joseph, Mo.	.75	1.25	1.75	2.25	2.55	2.85	3.75	4.35
St. Louis, Mo.	.50	.67	1.33	2.00	2.49	2.73	3.44	3.91
Springfield, Mo.	.75	1.00	1.50	2.00	2.50	3.00	3.90	4.50
Lincoln, Nebr.	.40*	.85*	1.25*	1.64*	2.02*	2.35*	3.35*	4.15*
Omaha, Nebr.	.50	.65	1.10	1.65	2.20	2.75	4.15	4.76
Average 16 cities West North Central	.70	.87	1.43	2.03	2.53	2.94	4.02	4.64
Wilmington, Del.	.50	.86	1.71	2.57	3.28	3.88	5.38	5.94
Washington, D. C.	.75	.75	.78	1.17	1.56	1.95	3.09	3.82
Jacksonville, Fla.	.80*	.70*	1.40*	2.10*	2.80*	3.50*	5.60*	7.00*
Miami, Fla.	1.00	1.14	2.28	3.23	4.18	5.13	6.18	7.63
Tampa, Fla.	1.00	1.00	2.00	3.00	4.00	5.00	5.90	7.00
Atlanta, Ga.	1.00	1.50	2.00	2.50	3.35	3.66	4.40	5.00
Augusta, Ga.	1.00	1.50	2.00	2.50	3.00	3.50	4.40	5.00
Macon, Ga.	1.00	1.50	2.00	2.50	3.00	3.50	4.40	5.00
Savannah, Ga.	1.00	1.60	2.20	2.80	3.40	4.00	4.90	5.50
Baltimore, Md.	.75	.75	1.34	1.95	2.19	2.42	3.53	4.20
Asheville, N. C.	1.20	1.20	2.00	2.80	3.60	3.80	5.30	6.30
Charlotte, N. C.	1.00	1.70	1.52	2.23	2.90	3.56	5.56	6.89
Durham, N. C.	1.00	1.30	1.90	2.50	3.10	3.70	4.90	5.50
Greensboro, N. C.	1.00	1.00	1.52	2.23	2.90	3.56	5.56	6.89
Winston-Salem, N. C.	1.00	1.00	1.52	2.23	2.90	3.56	5.56	6.89
Charleston, S. C.	.80	1.00	2.00	3.00	4.00	5.00	5.40	6.00
Columbia, S. C.	.80	.80	1.44	2.16	2.88	3.60	4.80	5.60
Norfolk, Va.	1.00	1.00	1.80	2.25	2.80	3.75	4.82	5.62
Richmond, Va.	1.00	1.00	1.50	2.25	3.00	3.75	4.82	5.62
Roanoke, Va.	1.00	1.00	1.60	2.40	3.20	4.00	4.90	6.00
Charleston, W. Va.	1.00	1.10	1.70	2.20	2.60	3.00	4.15	4.75
Huntington, W. Va.	1.00	1.10	1.70	2.20	2.60	3.00	4.15	4.75
Wheeling, W. Va.	1.00	1.10	1.70	2.20	2.60	3.00	4.15	4.75
Average 23 cities South Atlantic states	.91	1.08	1.71	2.30	3.02	3.64	4.86	5.72
Birmingham, Ala.	.75	.77	1.53	2.30	3.06	3.83	4.57	5.20
Mobile, Ala.	1.20	1.45	1.95	2.45	2.95	3.45	4.35	4.95
Montgomery, Ala.	1.20	1.45	1.95	2.45	2.95	3.45	4.35	4.95
Covington, Ky.	.75	1.20	1.70	2.20	2.70	3.04	3.94	4.84
Louisville, Ky.	0	.76	1.52	2.28	3.04	3.43	4.33	4.93
Chattanooga, Tenn.	.50	.86	1.71	2.57	3.42	4.28	4.56	5.13
Knoxville, Tenn.	1.00	1.55	2.15	2.73	3.23	3.73	5.23	6.23
Memphis, Tenn.	.90	.90	1.60	2.40	3.20	3.76	5.26	6.26
Nashville, Tenn.	1.00	1.00	1.71	2.57	3.42	4.28	5.11	5.83
Average 9 cities East South Central	.81	1.10	1.76	2.44	3.11	3.66	4.63	5.34
Little Rock, Ark.	.80	1.50	2.20	2.90	3.60	4.14	5.68	6.32
New Orleans, La.	.25	1.16	2.07	2.85	3.63	4.41	6.36	7.66
Shreveport, La.	1.00	1.00	1.40	2.10	2.75	3.35	5.05	6.05
Oklahoma City, Okla.	1.00	1.00	1.40	2.10	2.80	3.50	4.64	5.24
Tulsa, Okla.	1.00	1.00	1.52	2.28	2.96	3.52	4.94	5.51
Beaumont, Texas	1.00	1.00	1.90	2.73	3.43	4.13	5.05	5.68
Dallas, Texas	.50	.60	1.20	1.80	2.40	3.00	4.32	5.12
El Paso, Texas	.75	.80	1.60	2.25	2.75	3.25	4.50	5.10
Fort Worth, Texas	.50	.60	1.20	1.80	2.40	3.00	4.32	5.12
Galveston, Texas	.50	.70	1.40	1.83	2.23	2.63	3.83	4.63
Houston, Texas	.50	.70	1.40	1.83	2.23	2.63	3.83	4.63
Port Arthur, Texas	1.00	1.00	1.90	2.73	3.43	4.13	5.05	5.88
San Antonio, Texas	1.08	1.08	1.30	1.95	2.60	3.13	4.35	5.15
Waco, Texas	1.00	1.50	2.10	2.68	3.18	3.68	5.18	6.14
Average 14 cities West South Central	.78	.97	1.61	2.27	2.88	3.46	4.79	5.63
Denver, Colo.	.90	.90	1.20	1.80	2.40	2.90	4.40	5.40
Pueblo, Colo.	1.00	1.00	1.50	2.70	3.60	4.50	4.90	5.82
Salt Lake City, Utah	.90	.90	1.53	2.23	2.93	3.43	3.98	4.68
Average 3 cities Mountain states	.93	.93	1.51	2.24	2.96	3.68	4.43	5.30
Berkeley, Calif.	.40	.65	1.30	1.75	2.15	2.50	3.65	4.25
Fresno, Calif.	.80	1.01	1.62	2.03	2.54	3.05	4.58	5.43
Glendale, Calif.	.60*	.60*	.96*	1.44*	1.81*	2.06*	2.81*	3.31*
Long Beach, Calif.	1.00	1.00	1.00	1.50	2.00	2.50	4.00	5.00
Los Angeles, Calif.	.60*	.60*	.96*	1.44*	1.81*	2.06*	2.81*	3.31*
Oakland, Calif.	.40	.85	1.30	1.75	2.15	2.50	3.55	4.25
Pasadena, Calif.	.50*	.50*	.90*	1.35*	1.80*	2.25*	3.00*	3.50*
Sacramento, Calif.	.50	.98	1.40	1.85	2.25	2.60	3.65	4.35
San Diego, Calif.	.90	.90	1.36	1.94	2.61	3.09	3.99	4.59
San Francisco, Calif.	.40	.85	1.30	1.75	2.15	2.50	3.55	4.25
San Jose, Calif.	.50	.95	1.40	1.85	2.25	2.60	3.65	4.35
Portland, Oregon	1.00	1.00	1.10	1.65	2.06	2.45	3.86	4.22
Seattle, Wash.	.75*	.75*	1.10*	1.65*	2.20*	2.40*	3.00*	3.40*
Spokane, Wash.	.70	.70	1.10	1.65	2.20	2.80	3.20	3.40
Tacoma, Wash.	.50*	.50*	.90*	1.35*	1.80*	1.90*	2.30*	2.40*
Average 15 cities Pacific States	.62	.80	1.17	1.66	2.13	2.45	3.43	4.04
Average 130 cities Total United States	.78	.92	1.52	2.16	2.73	3.25	4.37	5.09

* City owns system.

Sewer and Water Improvements Financed Chiefly by Civic Generosity

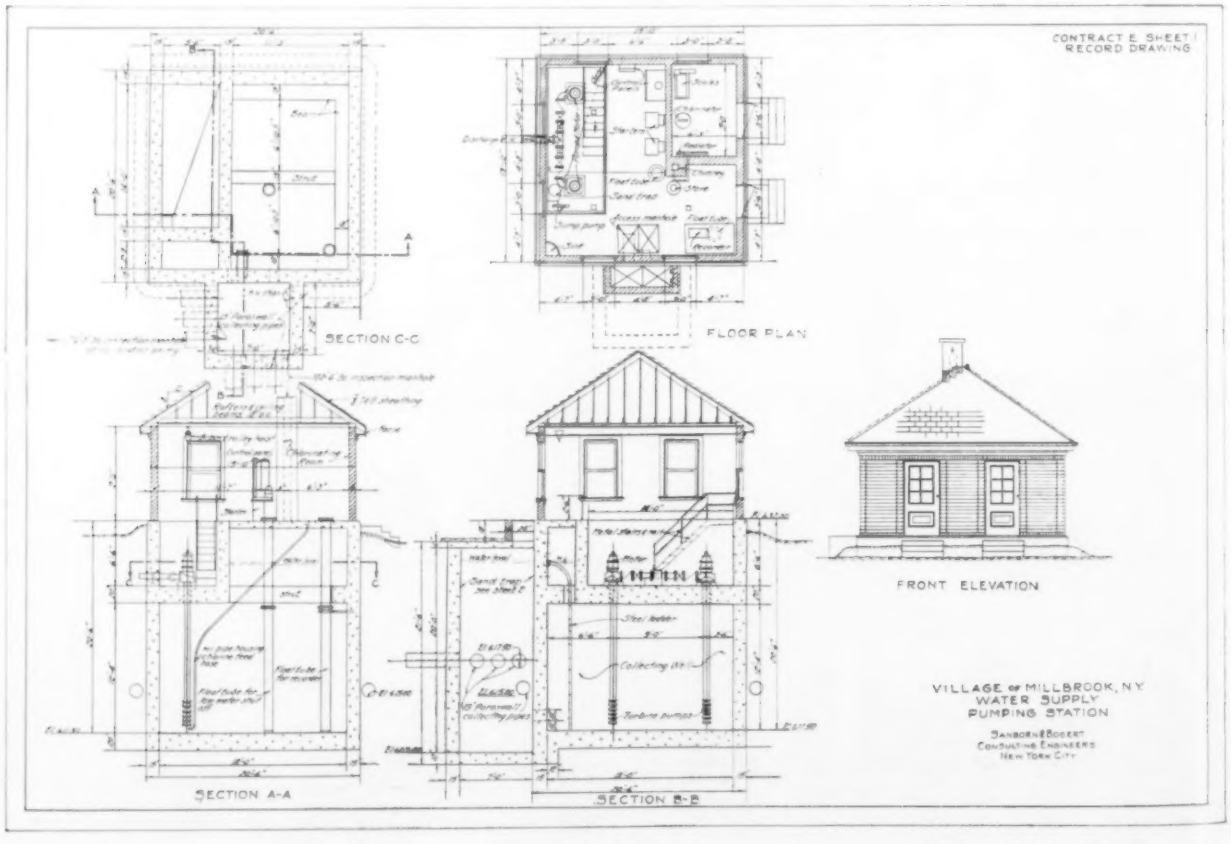
By CLINTON L. BOGERT
Sanborn and Bogert,
Consulting Engineers, New York City

AFTER deliberating for twenty years, the village of Millbrook, Dutchess County, N. Y., which is in reality a network of noteworthy country estates clustered around a few residential streets, decided to install both water and sewer systems in one operation. There are, outside of the infiltration gallery for the water supply, few unusual engineering features in the projects. The phases of the enterprise worthy of record are the advantages of installing two utilities at the same time by the same contractor, and the active cooperation shown throughout by the owners of the large outlying estates in putting across these projects for which they are assessed, and for which they receive in general no direct benefit aside from the satisfaction of promoting the welfare of the village.

For years, the Mayor, cooperating with the Village Board and the editor of the local paper, has been stressing the necessity for adequate fire protection, a continuous flow of pure water for domestic use, and adequate sanitary sewerage facilities, for the built-up portions of the village; but not until recently has he gained the active cooperation of the owners of the outlying estates who themselves did not need nor will be served by such facilities, and therefore would not be directly benefited. Since these estates carry about 33 per cent of the total valuation of the village, they would be taxed for a good share of the bond issue for these improvements. When conditions were explained to the people, and when an acceptable source of water supply had been agreed to, the bond issue for water was carried by a vote of 144 for and 6 against, and the sewer system, which would serve a smaller district, by 138 for and 11 against.

Impetus to Improvement Program

Despite the rural character of the community, one street is fairly densely populated by laborers who work seasonally on the nearby estates; conditions here were propitious for the outbreak of an epidemic, although one never occurred, as shallow wells for the domestic water supply were located indiscriminately within a few feet of privies. The fire hazard in this street is particularly great. A bad fire on an outlying estate in 1930 emphasized the helplessness of the center of the village to cope with a spreading conflagration without hydrant pressure. The villagers are



particularly proud of the Bennett School for Girls, which up to now has been without adequate fire protection. Many of the village wells went dry in 1930. An attractive little watercourse meandering through several sections of the village gave offense in warm weather, owing to the run-off from overflowing cesspools. All these items tended to focus public opinion on the desirability of the proposed improvements.

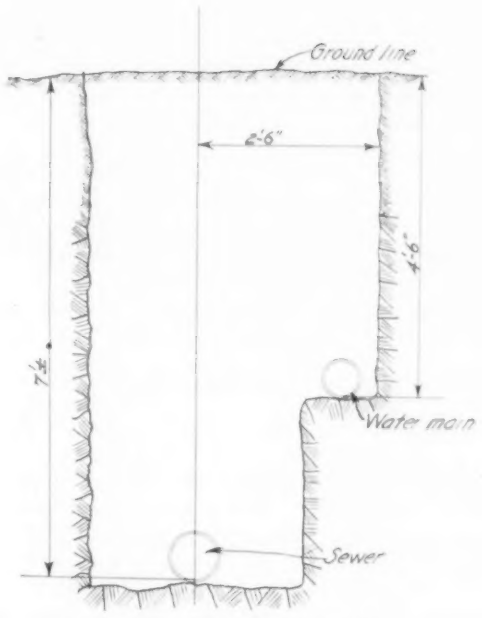
Unusual Layout for a Municipality

When the village limits were established, 37 years ago, evidently no thought was given to the complexities of water supply and sewerage, for the estates which made up a large part of the village each had their own water and sewerage systems. There are 1,300 people and 1,200 acres within the village limits, or a density averaging little over one per acre. The population figures have remained practically constant for several decades, to the satisfaction of the landed proprietors, who have no desire to see the village become industrialized. The village, however, is by no means so sparsely settled as the average density would indicate. The center of the village contains about 140 acres on which live about 900 people, so that the density here averages over 6 per acre; whereas the one congested street mentioned above has a density of 45 per acre; on some single lots there are three small frame houses.

Paying for the Improvements

Both the water-supply and sewerage systems are being financed out of bond issues which are an obligation of the entire village. The bonds of a face value of $200,000 were taken at par by George B. Gibbons & Co., and pay 4.3 per cent interest. With the costs of interest, amortization and operation spread over the entire village, the tax rate would be increased about 60 per cent for the first few years; this would have been a burden on the small homeowners. However, as soon as the plans took definite shape two "summer friends" of the village manifested their desire to help finance the work with an anonymous gift of $20,000. Then a Trustee of the village, who has one of the largest estates in the village, recognized this great increase in taxes. He secured the cooperation of another wealthy resident, and together they have undertaken, as a public gift, to meet all interest charges on a bond issue of $200,000 for a term of five years. This generous gesture, announced by the Mayor at a mass meeting called to consider the improvements, no doubt put the projects across. Neither of these gentlemen will receive a direct benefit to their estates from the projects.

THE PUMP HOUSE AT MILLBROOK



SEWER AND WATER MAIN IN SAME TRENCH

Besides this unexampled case of civic generosity, there are many others which bring out the affection borne the village by those who make their home there during the warmer months. The Mayor has several times received donations to be applied to civic improvements. The cost of the preliminary engineering report, authorized by the Trustees to focus public opinion on the needs of the village, was paid for by a benefactor, who also defrayed the costs of tests of the ground-water flow at the site of the infiltration gallery before the village was asked to vote on the proposition. The Memorial School, the Y. M. C. A. building, and the sightly beacon at the Bennett School corner have all been presented to the village by wealthy residents interested in its welfare. In September, 1930, a resident bequeathed $15,000 to the Village Trustees to be used for public improvements; the income from this bequest has been assigned to a sinking-fund to meet maturing water and sewer bonds. Recently wealthy summer friends asked the Mayor why the sewers were not extended to take care of more of the congested district, in which they had no interest beyond neighborliness. When the shortage of funds was explained to them, they offered the Trustees an unconditional donation of $10,000, which has been accepted.

Checking the Engineer's Estimates

So particular were the Trustees to justify their statements to the taxpayers that they did two unusual things before presenting the proposition to the vote of the taxpayers. First, they asked a reputable contractor to go over the proposed project with the engineers; then a meeting of the Trustees was called at which the contractor told them that he would be willing to undertake the work at the cost figures used in the engineer's report. Secondly, when it was determined to build an infiltration gallery for water supply on the Merritt Farm, the quantity of water

that could be extracted continuously from the superficial glacial deposit was unknown; therefore it was determined to make tests. A trench was dug about 100 feet distant from the brook about 6 feet deep and 100 feet long, and a pumping test of 52½ hours' duration was run. When these pumps were run at the rate of 300 gallons per minute for 15 hours, the ground-water level was lowered 3 feet; thereafter, for the rest of the test period, a rate of pumping of 120 gallons per minute held the ground-water level unchanged. Additional tests, after a supplementary trench had been dug at right angles to the first but with a greater depth, 12 to 14 feet, indicated a probable safe continuous yield of 180 gallons per minute.

Source of Water Supply

In 1912, the State Conservation Commission made a study of sources of water for the village, and recommended an upland stream with an impounding reservoir to afford a gravity supply. This same source was endorsed in the engineer's report of 1929, but proved unacceptable to the residents. While Millbrook is traversed by several picturesque and adequate streams, these cannot be recommended as sources of supply, for they are held too dear by the owners of the estates which they beautify. All available sources lie at some distance outside the village, necessitating a long pipe line between the source and the distribution system. At a meeting of citizens to consider the recommendations for a gravity supply, so much opposition developed to the depletion of the small stream under consideration, and so great a demand was voiced for a ground-water supply, to which the inhabitants had always been accustomed, that the engineers were asked to prepare a supplementary report. Meantime the Mayor had energetically reconnoitered the countryside and found the Merritt farm, of 140 acres, which was practically abandoned, and which was the focal point of two confluent streams, with a combined watershed of 10 square miles. The glacial deposits on the farm made it a promising site for wells to be fed by distant infiltration from the stream. As soon as the engineers had approved the site, and previous to the pumping tests described above, the Trustees took an option on the farm, and eventually purchased it at a very reasonable figure. When the opportunity is presented, the Trustees expect to sell off the excess land, reserving a liberal plot at the infiltration gallery.

Infiltration System

A reinforced-concrete box, about 21 feet square in plan, was constructed with its open bottom 20 feet below the ground level, and 17 feet below the normal water-level in the brook, which is distant about 100 feet. This well has a capacity of about 25,000 gallons. Water enters through the open bottom, and from two infiltration galleries at right angles to each other excavated to a depth of about 12 feet, in which are laid three lines of 15-inch Walker-Poroswall pipes, about 100 feet long. A line of pipe was also laid around the walls of the building when the excavation showed an exceptional quantity of ground-water here. Pumps of the deep-well type are installed in the open well; while centrifugal pumps might have been used, deep-well pumps were chosen, because they can be more economically placed, requiring no dry well. In practice it is found that the ground-water can be lowered to the shut-off level of the two 250-gallon-per-minute pumps, in about 2½ hours. Under test, 88,800 gallons were pumped in 2 hours and 35 minutes.

Bids for Sewer and Water Systems

It is unusual to find a municipality ready to install both of these utilities at the same time. In the case of Millbrook, there was a distinct advantage, for the contractors could build both at the same time, thereby cutting down their overhead. Nine bids were received for the distribution system, Contract "A," and nine for the sewer system Contract "C," and seven contractors submitted bids on both contracts. Ellis B. Edgar, the lowest bidder, was awarded Contract "A" at $69,363.50; he was also lowest bidder on the treatment plant, Contract "D," and was awarded it. The lowest bidder on the sewerage system, which involves but 7,500 feet of pipe, was $5,000 below the engineer's estimate. When the bidder explained his low bid as due to having made out his certified check at a distant bank before having gone over the ground carefully, and that therefore he was constrained to lower his bid to conform to an otherwise inadequate check, he was allowed to withdraw his bid. At this time there came up the question of the advisability of having one contractor do both street jobs so that the responsibility for poor backfilling or traffic conditions could not be divided between two contractors. Mr. Edgar offered to build the sewers at a substantial reduction and offered to reduce the costs of rock still further by laying the water pipe on a ledge in the trench blasted out for the sewer pipe. This offer was accepted on advice of counsel, although Edgar was fourth bidder from the lowest out of nine.

Gratifyingly low bids were received on all five contracts; this can be explained by the form of proposal, under which the bidders are not compelled to bid on any particular type of cast iron pipe; alternate bids were received for de Lavaud, Sand Spun and standard cast iron pipe; standard valves and hydrants were specified, and acceptable joint compound. In other words, the contractor was left with a free hand to shop around to get the most favorable prices on standard materials.

As a consequence of the favorable bids, the Trustees found themselves in possession of surplus funds after the $200,000 worth of 4.3 per cent bonds had been sold at par. When it was observed that the contractor conscientiously backfilled all trenches and kept the streets as passable as possible, the Trustees decided to utilize the unexpended balance to extend the sewer system, as there had been a demand from the beginning for more sewers but the Trustees wanted to keep the bond issue down to $200,000.

Relief of Local Unemployment

Owing to the extensions of the water and sewer lines, the time limit of the contractor has been extended beyond September 1, 1932. This unusual procedure was justified, for the contractor was able to utilize some of the local unemployed labor on his house connections for the sewer and water, and on other work where hand labor can be economically employed. It is noteworthy that the men who were sent to work by people interested in the unemployment situation failed to make good, whereas men who themselves applied for jobs were generally found satisfactory. Sixty-five per cent of the men employed by the contractor are from the vicinity.

Water Meters—Are They a Benefit?

And a Description of an Organization That Set 100 Meters a Week

By **E. H. RUEHL**
City Manager, Bluefield, Va.

THE problem of making the initial installation of water meters in a community always brings up much discussion of the possible advantages and alleged disadvantages of meters, so that this question is perennially new. Metered water service, however, is being acknowledged more and more as the best all-round method of distributing that indispensable commodity, water. This is especially true since the unprecedented drought of 1930 and its continuance in 1931 in many states. If more communities had been metered at the time, the effect of the drought would have been less severe in many instances, owing to the lessened wastage of water.

Reasons for Metering Water Services

The installation of a meter on an individual service is the fairest way of selling water to each consumer, for he then pays in proportion to his consumption of water. The water department or water company has a good check on the amount of water sold, and by comparison of the total readings of the domestic meters with the readings of a master meter it is possible for the officials to better establish the amount of losses and leakage and thereby reduce the waste in the system in general. Leaks in consumers' service lines are much more easily located where the services are metered. A knowledge of the amount of water consumed is essential in establishing equitable water rates, and the only way in which this information can be obtained and analyzed is by the metering of all services.

In some cases, and especially in municipally owned plants, there are certain institutions, such as schools, hospitals and the like, that are supplied with water without cost. These should be metered, and the meters should be read regularly to get the full benefit of metering.

It has been definitely shown that as meters are installed, the waste of water by consumers is reduced, and this in turn effects economies in the amount of power required to pump the water, if it be a pumping plant, and in treatment costs, which are increasing every day.

As the water requirements of a city are kept within bounds and are more or less controlled, the size of the treating and pumping plants and storage and distribution systems is kept to a minimum, thereby keeping the capital investment as low as possible, as well as reducing the necessary interest and sinking-fund charges, all of which results in keeping the water rates at the lowest figure.

As sewage treatment will eventually become necessary in many places not now so served, the lowering of water losses and wastes will redound to the city's advantage in that a plant of smaller capacity can be built than if water usage and wastage are uncontrolled.

Unfavorable Comments on Metering

A few selfish and unreasonable consumers will usually be found in any community who will claim that water should be free and that for the health of the community consumers should be permitted to use unlimited quantities. This argument can be overcome in most cases by explanation, and despite the fact that many consumers may be adamant at first, good results are usually obtained through logic and diplomacy.

Another argument against metering somewhat allied to the first is the claim that the use of water will be severely restricted through the installation of meters and thereby sanitary conditions will become bad. For all usual purposes about 25 gallons of water per capita per day is all that is absolutely necessary, and under any ordinary rate the cost for this amount of water for the average family for an entire month is very small, in most cases less than the cost of one filling of the gasoline tank of the family automobile.

Ownership and Location of Water Meters

The ownership and location of water meters are two subjects on which divergence of opinion exists. I feel that the meter should be owned by the water department or company, being charged to the capital account, and all maintenance work should be done by the utility and charged to operating costs. In Virginia, meter setting just inside the curb line offers many advantages over other locations, which readily outweigh any disadvantages caused by the small additional cost, if this be the case. In a good many houses south of the Mason and Dixon Line, there are no basements, which practically excludes that location for the meter. Although there may be heavy snows during the winter, especially in mountainous sections, they are not very deep and do not as a general rule remain on the ground for any length of time and therefore do not adversely affect any operation that might be necessary in connection with the curb setting if properly installed.

The advantages of an outside setting, in the sidewalk space, are many. Meter reading is greatly facilitated owing to the fact that the reader need not wait for a response from the householder; and should the householder be absent, it is unnecessary for the reader to make another trip for the reading. The distance meter readers have to walk is lessened when outside settings are used, and this in turn permits more meters to be read per day. In outside settings the meter is always accessible to water department employees, not only for reading but for inspection, testing and repairing. While meter reading is not ordinarily classified as a hazardous occupation, attacks from vicious dogs are not infrequent when readers approach a house. This danger is obviated with the outside setting. Further, the possibility that unauthorized persons may enter the house in the guise of water-works employees is generally eliminated. The chance of the meter's being covered up by rubbish, coal, kindling wood, or old furniture is done away with when the outside setting is used.

More accurate readings can be obtained with outside settings, because of better lighting outside than generally exists in basements, under porches or other places where meters might be set. The line of separation between water department's and property owners' liability is clearly defined, and there is not much chance of unauthorized connections made behind the meter.

In case of the necessity of cutting off the water for non-payment of bills, there can be no dispute as to entering the premises if the meter and control are located at the curb line. The outside setting should be in a locked box, and, as it is below the ground, it is not apt to be tampered with as in the case of a setting in a more conspicuous place and not protected by a box. There is less danger of damage to the meter by hot water if the meter is set at the curb, and danger from freezing is practically eliminated in a well-set meter.

Meter Boxes

The following remarks pertain to the smaller sizes of meters, up to one inch. When larger meters are used, the conditions must be studied separately and the settings made especially to suit. A properly set meter, although not always the cheapest, will receive more attention in general from water-works operatives and in turn will pay higher returns to the department.

It is a good plan to set the meter in a yoke, with at least a control valve at the inlet side, although some departments prefer valves at both the inlet and outlet sides. This does away with the customary curb stop and box. The meter in its yoke, and with the control valve, should be set in an earthenware, concrete or iron box with sufficient clearance between the risers, if they be used, so that the cold ground outside cannot cause the water in the pipes or meter to freeze. A type of box that has proved very satisfactory where mild winters are encountered is 18 inches in diameter and 24 inches deep, with slots at the lower end for varying the depths of the service pipe, which in Bluefield we install about 24 inches below the ground.

It is important that a lid be provided that fits the top of the box tightly, preferably being locked on. If the lid is tight, there is no circulation of cold air in the box, and consequently little danger of freezing. Another advantage is that if the lid is fastened on, there is no danger of persons catching their feet in the hole, with possible resultant damage suits.

It is important that the bottom of the box extend below the maximum frost line so that the warm air from below can rise up around the meter and keep the atmosphere in the box well above freezing. In extreme cases, it has been found that a smaller tile pipe, about 8 inches in diameter, put into the ground below the bottom of the regular box to reach warmer levels, overcame freezing troubles.

Meters should be read monthly if possible, for by doing so, a closer touch is kept on losses and wastes, and by visiting each meter every 30 days, stopped meters and other irregularities are kept under better control. In case a customer has a leak in his service, he can be notified within a reasonable time if the meters are read monthly, but if they are read quarterly, the amount of leakage is much larger and is bound to cause some ill-feeling.

Bluefield recently attacked the problem of setting 700 meters at the rate of about 100 per week. First, a sketch was made and the various kinds of equipment were decided upon. After the meters, yokes, boxes and covers were ordered, figures were made up giving the length of pipe to be cut from the service to allow for elbows, yoke, valve, etc., and the vertical distance that the cover, meter, yoke and fittings required was figured and each made into a constant.

Actual installation started with several men digging holes, located from the curb boxes wherever possible, in a certain well-defined section, so that one foreman could keep all things going. Two men, both of whom had some previous pipe-fitting experience, were formed into a gang and were given instructions on how to set the meters, and then worked together for about a day. These men were each given a helper, and two setting gangs were formed; the two helpers were in turn given helpers, and thus four setting gangs were formed in a few days and carried the work through with as many men as were required to keep the holes open ahead of them.

Each of the two-man setting gangs was furnished with a ratchet die holder with ½- or ¾-inch dies, a hack saw, two 10-inch Stillson wrenches, a pipe vice attached to a four-legged plank, a homemade wooden straightedge and a pair of hip boots. The men provided their own rules. The meters, yokes, boxes, covers, pipe, etc., were carried to the site in a small truck. Galvanized nipples of various lengths were purchased and used wherever possible, for they could be purchased cheaper than we could buy, cut and thread the pipe.

Setting the Meters

When the hole was opened down to the service pipe, the meter-setting gang came along and laid the straightedge across the hole and measured down to the service pipe, and from this the proper constant, referred to above, was subtracted, which gave the length of riser necessary. If there was a standard nipple of length somewhere near this dimension, it was used, but if not, the helper cut pipe to the proper length and threaded it. The meter setter in the meanwhile was cutting the piece of pipe of constant length out of the service line and threading the cut ends for elbows. The risers were then screwed in and the yoke and meter set, after which the box was put in the hole, by using a set of specially made hooks, the box was centered around the meter, and the risers and covers put on.

Two men composed the backfilling gang and followed up the setters, backfilling holes and seeing that the lids were properly fastened.

If the existing cut-off in the service line was so that it could be used to control the water, it was used, but if not, the meter setter would cut and thread the pipe under pressure, which took only a few minutes, and screwed on the riser pipe with the control valve, bailed out the hole and went on, without having to dig back to the main or cut the water off from a section of the town. The water which was lost did not amount to an appreciable quantity. One foreman looked after the entire job, and 700 meters were set in seven weeks.

The cost of this work complete, including tools, boots, and everything, was slightly under $19 per setting, which included, however, the changing of some services where it was necessary. Where the services are rather close together, one foreman could handle about six meter setting gangs with the necessary hole diggers, and could set about 150 meters per week, if the work was well planned.

Acknowledgment.—From a paper presented at the Third Annual Conference of the Virginia Water and Sewage Works Association.

Collect Ground Rent Instead of Taxes

Excerpts from Report of a Special Committee* of the American Institute of Architects, Submitted at the Annual Meeting of the Institute, in Washington, D. C., April 27, 1932

SINCE problems of taxation lie squarely in the field of business, the committee assumed that they should be subject to, and should be judged by, standards of business universally recognized to be sound. These standards require that all transactions be based upon a quid pro quo exchange—wealth of one kind for wealth of another kind—in which exchange both parties are satisfied that they receive the kind of wealth they want, more than the kind of wealth they give. How, then, do exigencies of taxation conform to sound business principles? . . . .

It is a plausible query, whether or not the average building owner has a clear idea of what goes to make a site worth the rent he pays for it. He knows in a way why he wanted the site, but does not analyze these reasons. If he did, he would realize that it was because at that particular location his tenants can enjoy individually and collectively created public advantages not to be enjoyed elsewhere, and that he can sell them these advantages along with the advantages of his building. No other location is exactly like his. It has possibilities in varying measure, of access to well-lighted, paved streets, parks, boulevards, schools and libraries; to water, sewer and light services; to transportation facilities; to markets, banks, hotels, theaters, churches, stores and office buildings; to health, police and fire protection; things necessary to the well-being of organized society, which distinguish civilization from barbarism.

Basis of Rent

Did he ponder these things, the building owner would realize that these advantages were to be had at that particular location because the requirements and desires of all the people in pursuit of their happiness had called them into being, with aid of labor, and of public and private funds, expended in every branch of industry. . . . Were none of these products of other people's efforts, both public and private, to be found there, the site would be valueless, because there is no known legerdemain whereby the site could be moved to another location where these same advantages might be had. Except for these fruits of community life, the site owner, as such, would have no power, though he have the legal right, to collect rent for the use of that site. . . .

It is clear that the site owner does not own these public improvements. It is equally clear that he did not produce them. Yet, the privilege to use them is all that he has to offer the building owner in return for rent. Therefore, the rent he receives cannot, on sound business principles, be owing to him; it must be owing to those who produced the wealth embodied in these public improvements—the community as a whole. Rent is the public's natural income.

That he does, or can, collect rent, the committee found to be due—in addition to the fortunate location of his site—to common acceptance of the fallacy that rent for use of a site, and interest for use of capital, are the same sort of thing. If these were the same, they would be affected the same way by the same causes; but experience shows that they are not. For example, a tax on site values reduces the selling price of any site to which it is attached, because its payment reduces the income from the site by the amount of the tax; but a tax on capital raises the amount that must be paid for the use of that capital; that is, the higher the tax on a building, the more must be paid to occupy it. In other words, while taxes increase prices on labor products, they always reduce site prices. Rent adds nothing to total wealth, while interest is a natural increment of production.

A building owner seeks opportunity to sell building accommodations, which are the result of the combined efforts of labor and of capital without the aid of the site owner; the site owner, as such, seeks a privilege to collect rent without contributing, as labor and capital do, to the wealth of the community. The site owner thus becomes the legal collector of community-created values, although he could not claim to be the producer of them. What he receives is taken from wealth produced by labor and capital, and is measured by enormously increasing values of land. . . .

Resulting Penalties

This the committee holds to be a violation of sound business principles. Inevitably, it imposes a severe penalty; because, to make up the loss of rent paid the site owner, for use of public improvements he neither produced nor owns, taxes are levied on the private wealth of the very people who created the values in the site, which the site owner is granted the legal privilege to sell. . . .

If the question be asked, why is the site owner not "entitled to interest on capital invested" in his site, it is only necessary to point out that the terms so used involve a colloquial, not a scientific, use of language. All economists agree upon the mutually exclusive meaning of the terms, rent, interest and wages, as returns, respectively, for use of land, capital and labor, to confuse which is to lead reasoning on the subject astray. Rent is not interest, because interest is return solely to capital, and capital is wealth used in production. Land, again, is not wealth, because wealth is the creation of labor and capital, and no land was ever produced by labor and capital. Rent paid to a site owner for the privilege of using a site is productive of nothing; what one party gains, the other party loses. This, certainly, is in direct violation of sound business principles; it fits perfectly into the ethics

* The Committee Chairman was W. R. B. Willcox, of Eugene, Ore. The other members were: William B. Faville, of San Francisco, Calif.; Charles A. Favrot, of New Orleans, La.; Ellis F. Lawrence, of Portland, Ore.; Dalton J. V. Snyder, of Detroit, Mich.; Rudolph Weaver, of Gainesville, Fla.; Arnold Southwell, of San Clemente, Calif.; John S. Siebert, of San Diego, Calif.; and Joshua H. Vogel, of Seattle, Wash.

of poker, but men do not have to play poker, as they have to use land, to live. . . .

Extension of Cities

A corollary of this unbusinesslike practice is found in necessary extension of cities far beyond essential requirements of population, to provide sites for those who would use them. . . . Vacant sites augment the inconveniences, the inefficiency, and the cost of business and living, due to loss of time of citizens, and wear and tear of vehicles, passing these idle areas. They require increase, and lessen effectiveness, of police and fire forces, while unkempt sites work destruction of esthetic and property values. . . .

The committee observes, also, the destructive effects of taxation upon the execution of city, town and regional plans. It is not to be denied that parts of many excellent, comprehensive plans—altogether many and immense projects—have been executed, which have aroused popular interest in civic betterments and have elevated public taste in city building. But, considering the time and money spent during the past forty years by plans commissions, city committees, professional organizations, engineers, city planners and architects,—the voluminous literature emanating from every branch of the press, and the many speakers engaged in "educating the public" on the subject,—the meager compromised achievements, in proportion to populations and areas in this country, should shock the intelligence of architects.

So long as tax funds pay for public improvements, and rent paid for their use is given away as the prize to be won by lucky site owners (who, a decade ago, were reckoned as only 1 in 535 of the population) the idea that universally distributed benefits can come from present unbusinesslike methods is mistaken. Affected site owners, naturally, will fight for or against every proposed betterment. Their strifes may be followed in the press, in battles in city councils, state legislatures and the courts, in revealed or suspected bribery, while the public waits, often for years, for improvements desperately needed. Chicago was twenty-five years bringing Michigan Avenue to its present state, while neighboring streets have remained in rotten condition, and a like disorder has extended in all directions faster than any accepted method of correction could be applied. In varying degrees, the same thing is happening to every city, town and wayside in this country. . . .

Conclusions

The committee regrets that time does not permit submission to the convention of particular illustrations of effects of laws governing rent and taxes upon the practice of the profession. They would, however, tend simply to strengthen the view that, if natural and healthy improvement in architecture is to come, double payment of rent and taxes must cease; a legal stop must be made to private appropriation of public values, and public confiscation of private wealth; the public's rent must be used for public purposes, and private wealth left inviolate for private purposes; rent must be collected for government revenue, and all taxation of whatsoever sort must be abolished.

The Citizenship Values of Rightly Celebrated Public Holidays

BOSTON has the distinction of being the only city in the United States that plans holiday celebrations for occasions throughout the year, with a permanent department for the purpose. The system functions as one of the activities of the Mayor's office. It comprises a Director of Public Celebrations appointed by the Mayor, with an Assistant Director and a small force of permanent aides, together with the Citizens' Public Celebrations Association, which since 1912 has cooperated with the city in planning and conducting observances of established holidays. This Association plans and carries on the general events of such holidays as New Year's, Christmas, the Washington and Lincoln anniversaries in February, Patriots' Day (April 19), Independence Day (Fourth of July), and Columbus Day (October 12). Local committees are formed each year to plan for local holidays—Evacuation Day, Bunker Hill Day, Dorchester Day.

Effort is made to have each celebration beneficial, constructive and generally productive of sound citizenship, as well as enjoyable. The spiritual foundations of life and government are manifest in varied serious ways in the municipal programs for Christmas Eve each year, and the celebrations of Evacuation Day, Bunker Hill Day, and the Fourth of July are of the noisy, enthusiastic form that the forefathers recommended, but with due attention to the historic and patriotic features, such as the annual oration in Faneuil Hall, and the reading of the Declaration of Independence from the balcony of the Old State House to assembled citizens, just where the original ceremony was performed.

An example of constructive work was the development of a worthwhile and interesting method for the commemoration of Patriots' Day. A few years ago this holiday had no popular appeal, and its observance was perfunctory. An excellent annual program is now participated in jointly by seven or eight cities and towns, and centers on the reproduction of the historic ride of Paul Revere and his companion, William Dawes, Jr.

The celebration of Columbus Day now brings to the fore the all-American aspect that belongs to this anniversary above all others in the calendar.

Occasionally a celebration of different and temporary character must be devised, as in the case of the Tercentenary of the founding of Boston, and the George Washington Bicentennial, when the established system expands to make a basis for great celebrations continuing through several months.

E. B. MERO.
Secretary, Citizens' Public Celebrations Association, Boston, Mass.

Vacation Camp Warnings

Be sure of the purity of the camp water supply. Proper garbage disposal is an essential for all camps. Secure immunity against typhoid fever by inoculation before leaving home.

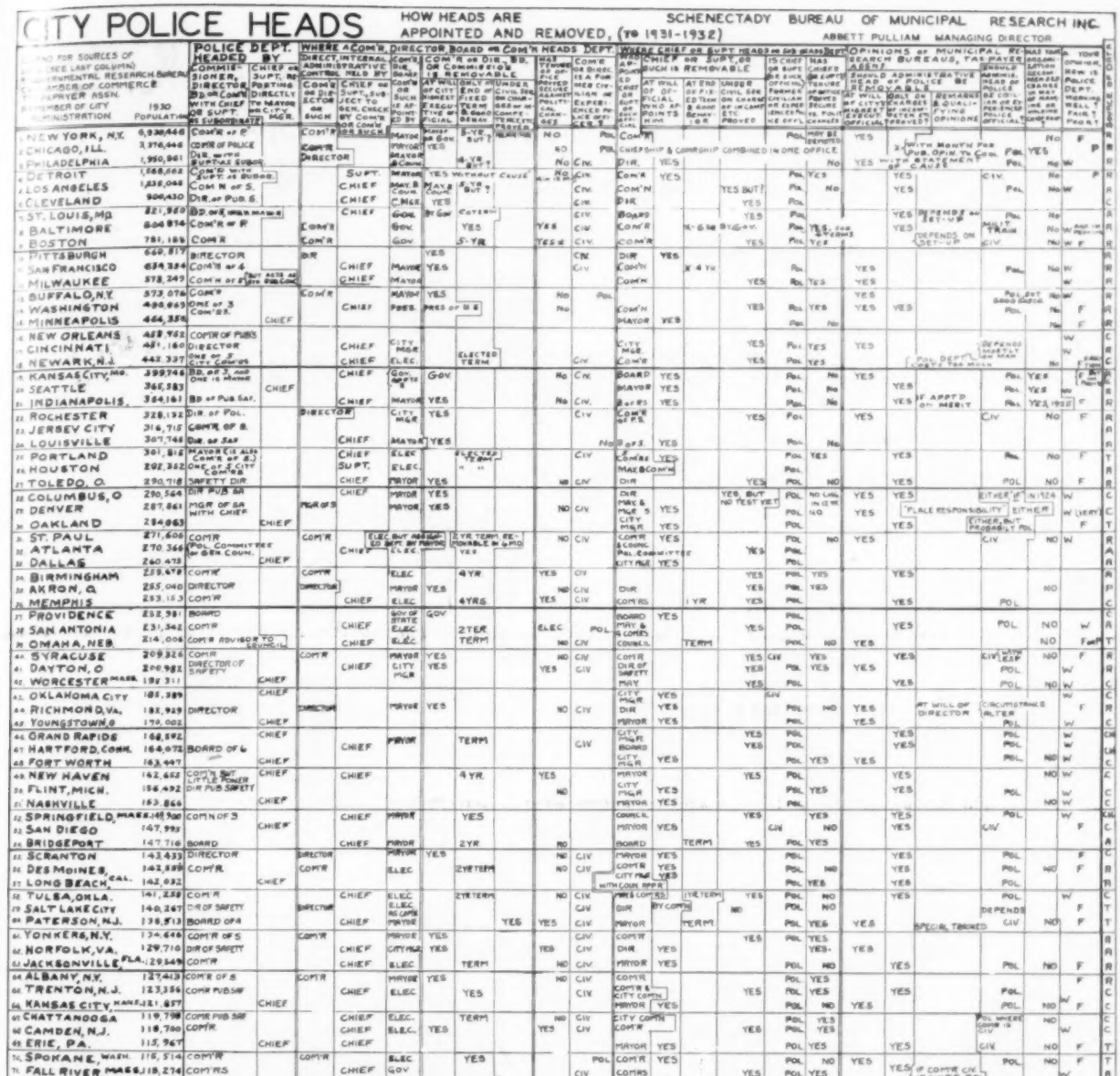
—NEW YORK STATE DEPARTMENT OF HEALTH.

CITY POLICE HEADS

HOW HEADS ARE APPOINTED AND REMOVED, (TO 1931-1932)

SCHENECTADY BUREAU OF MUNICIPAL RESEARCH INC.

ABBETT PULLIAM MANAGING DIRECTOR



Courtesy Schenectady Bureau of Municipal Research, Inc.

HOW HEADS OF POLICE DEPARTMENTS IN CITIES OF OVER 80,000 POPULATION ARE APPOINTED AND REMOVED

Good Riddance to Rubbish

Disposal Methods Used in Oak Park, Ill., for Garbage, Rubbish, Ashes and Tin Cans

By **DUDLEY C. MEYERS**
Commissioner of Public Works, Oak Park, Ill.

DELIVERING A LOAD OF WRAPPED GARBAGE AT THE OAK PARK INCINERATOR

ALL garbage and other wastes are collected by the Street Department in Oak Park. Garbage and combustible wastes are hauled to the village incinerator, and ashes, tin cans, street sweepings and incombustible wastes to a dump about seven miles from the village. This dump is in low ground that needed to be filled, and there has been no expense to the village for its use, with the exception of the building of a road, some stone for filling and the services of one man at the dump.

The collection force and equipment consist of eighteen men, three one-ton Ford trucks, three two-horse wagons, and three one-horse carts working nine hours a day. Collections of garbage are made twice a week excepting when prevented by unusually bad weather.

The Nye incinerator is operated thirteen hours per day except on Sundays and holidays. It is operated by five men, two on the charging floor, one in the furnace room during the day, and two at night cleaning the furnaces and buildings. The plant has continued to operate very satisfactorily, without any complaint as to odors, smoke or other nuisances. The fact that the amount of garbage burned in 1931 does not appear to be as large as in former years is due chiefly to the accurate weighing of the garbage on scales, while in previous years the amounts were estimated, and the estimated weights were greater than the actual weights. Also, in 1931, there was very little rain, and there is considerable difference between the weight of a load of garbage when it is dry and when it is wet. Most of the leaves from the streets have been disposed of by burning in the incinerator.

In addition to the garbage and combustible waste collected by the Street Department, a considerable amount of

TRAILERS BRINGING GARBAGE AND REFUSE TO THE INCINERATOR

combustible rubbish and waste materials from hotels, restaurants, markets and fruit stores has been brought to the incinerator by privately owned equipment. Costs for garbage and combustible refuse are shown below:

Collection		Disposal	
Labor	$26,201.31	Coal	$1,544.65
Teams and trucks	4,813.60	Labor	8,370.00
Supplies and repairs	24.07	Teams and trucks	181.95
Superintendence	1,243.75	Supplies and repairs	421.35
Hired teams	12.00	Superintendence	393.50
		Light and power	710.22
	$32,294.73		$11,621.67
Cost per ton	$2.149	Cost per ton	$.773

Total cost of collection and disposal of all garbage, $43,916.40.

The combustible refuse collected by village teams and brought in by the stores furnishes practically all the fuel needed for the burning of the garbage. When the garbage was very wet, or when the amount of combustible materials collected was not large, it was necessary to burn some coal. During 1931, 2,369.15 tons of combustible waste was collected by village teams and trucks. This included 1,295 cats, dogs and other small animals. A total of 11,072.05 tons of garbage was collected, and 1,587.60 tons of garbage and combustible waste was brought to the crematory by grocers and market men, making a total of 15,028.80 tons brought to the incinerator during the year, and an average of 49.11 tons of refuse burned per day. This refuse, which was made up of 17,716 loads, consisted of 11,131 loads of garbage, 2,263 loads of incombustible waste and 4,322 loads of market refuse.

Disposal of Incombustible Waste

Ashes, tin cans and other miscellaneous incombustible household wastes were collected together about once a week. These materials were disposed of by hauling to the dump at Hillside. In the portions of the village where there are no alleys, ashes, tin cans and miscellaneous waste are set out at the curb, and they are removed by the Street Department on Tuesdays in the southern section and on Fridays in the northern section. The costs of collection and disposal of incombustible waste are shown below:

Labor	$39,722.88
Teams	3,700.05
Trucks	2,672.27
Hired teams and trucks	3,932.50
Supplies and repairs	882.88
Superintendence	1,889.20
	$52,799.78

Amount collected, 61,577 cubic yards, or 9,535 loads.
Cost per cubic yard, $0.8635.

The New Municipal Hot Mix Asphalt Plant in Minneapolis

By **F. T. PAUL**
Paving Engineer

City Engineering Department Prepared Requirements and Specifications in an Unusual Way to Secure the Most Satisfactory Plant

IN order to provide the hot mix asphalt plant best suited to meet the requirements of the city of Minneapolis, Minn., and also to secure the benefit of competition of manufacturers' asphalt plants without restricting them, giving the city the benefit of their best design, the Engineering Department prepared specifications outlining the requirements and provided a blueprint of the site of the proposed plant. Five manufacturers of asphalt plants submitted proposals, plans and specifications.

Some of the Requirements

The bidders were informed that the city's specifications were to be considered as a guide but were not to restrict the manufacturers in any way in controlling their design to meet the city's requirements. A capacity of 75 tons per hour based on a 1.5-minute mixing time was required by the city, which called for a 4,000-pound pug-mill type mixer. The plant desired by the city in other respects would necessarily coordinate with this mixing capacity. As the working season in the climate of Minneapolis is short, with an 8-hour working day, the demand on the plant at times will be very heavy.

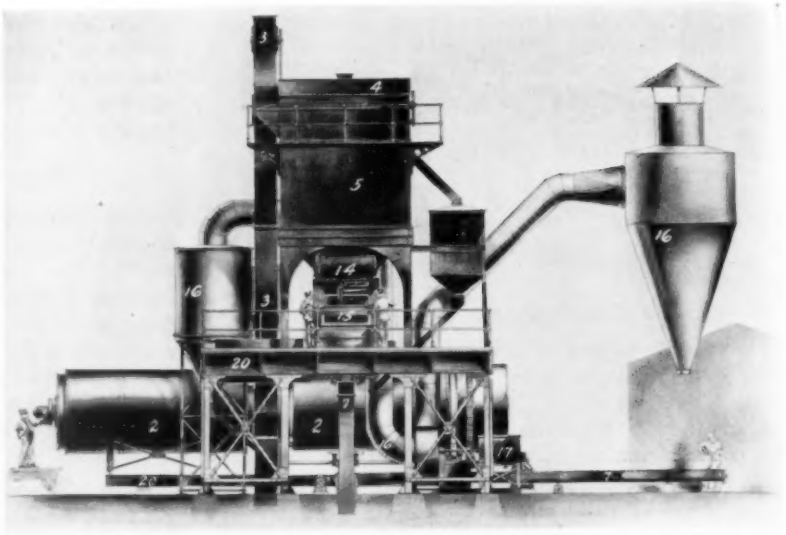
The city required test runs on the plant before its acceptance, the final test extending over a period of three months. A bond of 100 per cent of the contract price was required.

To assure the city and to guide the bidders so that no detail of the plant would be overlooked, and to place the bidders on an equal competitive basis as well as to permit the city to give fair consideration to the design of each manufacturer, it was requested that the bidders submit plans and illustrations of the plant they were bidding on, the specifications prepared as follows:

1. Conveying the mineral aggregate into the dryer.
2. Drying the mineral aggregate.
3. Conveying the mineral aggregate to screens.
4. Screening the mineral aggregate.
5. Storing the mineral aggregate in separate bin compartments of 50 tons total capacity.
6. Weighing the mineral aggregate into separate sizes.
7. Conveying the filler dust to the weigh-box.
8. Weighing the filler dust in the weigh-box.
9. Storing the filler dust in the aggregate bin.
10. Conveying the mineral aggregate and filler dust to mixer.
11. Unloading the asphalt cement from tank cars.
12. Storing the asphalt cement. Storage capacity ——— tons.
13. Heating the asphalt cement in storage by steam.
14. Conveying the asphalt cement to asphalt weigh-bucket.
15. Weighing the asphalt cement and conveying into mixer.
16. Dust-collecting system—to overcome the dust nuisance.
17. Power. Electric motors, speed reducers and transmission machinery.
18. Boiler (recommendation only), for asphalt storage pipe lines and steam jackets.
19. Temperature controls. Recording pyrometers.
20. Plant structure—tower platforms, steps, guard-rails and safety guards and housing.

By reference to the accompanying illustrations and the numbers on the various parts of the plant corresponding to the numbers in the list above, the successful manufacturer's system for producing hot asphalt paving mixture can be followed readily. Number 1 indicates a "means for conveying mineral aggregate to dryer"; and so on for each of the twenty items of the complete assembly.

The city's specifications informed the bidders that the price bid, the design, economy of operation, the materials built into the design, the workmanship, and the fitness of the plant for the site, all would have a bearing on the award of the contract. The city's Enginering Department, in order to reach a conclusion as to which of the five designs would meet the requirements best, carefully analyzed each one of the twenty assemblies that each manufacturer proposed to furnish in the make-up of his particular complete asphalt plant; as there were six considerations for each of the assemblies, 120 points of consideration were required for each of the five manufacturers bidding; the total was 600 separate considerations in order to reach a definite conclusion.



SIDE VIEW OF THE PROPOSED HOT MIX ASPHALT PLANT FOR MINNEAPOLIS

This is a reproduction of one of the photographs submitted by the manufacturer in accordance with the requirements of the Engineering Department

Bids Received

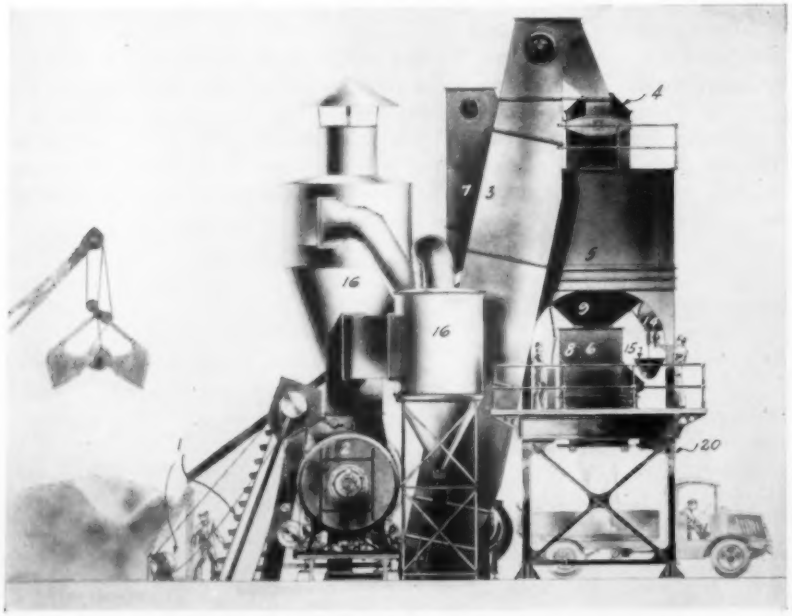
The bids received ranged from $26,994 to $44,450. With this wide range in the prices bid, an apparently difficult problem was faced by the Engineering Department in order to determine the best bid for the city to accept. This was finally worked out on a chart schedule of analysis whereon the twenty parts, or assemblies, called for were listed. Each manufacturer was given credit on the basis of a predetermined and varying percentage wherein the design, economy of operation, materials, workmanship, and fitness of the plant for the site, were given careful consideration separately on each assembly. The highest-priced plant had the greatest percentage of credits. The engineers then gave the other bidders the credits they were entitled to by reason of lower price, and still the highest bidder, who still had the highest percentage, was entitled to the award.

Evaluating the Bids

The Engineering Department, not being thoroughly satisfied, made a further calculation based on the total weights of the steel entering into the design and manufacture of the five plants, as far as this information was available from the manufacturers themselves, and this showed that the price per pound of materials in the highest priced plant was less per pound than in the lower-priced plants. A further analysis was made on the comparative quality of the materials entering into the different plants.

In reaching their conclusion the engineers gave first consideration to price and economy of operation, in which the fuel used in drying mineral aggregate was a considerable item. The Simplicity System plant illustrated, which received the award, has a double shell type dryer; the asphalt storage for the asphalt cement is the composite type, and the feeder to the dryer is of the automatic apron type.

The interest shown by the asphalt plant manufacturers in preparing the best designs possible to meet the city's requirements indicates that manufacturers of asphalt plants have done much in recent years to improve plant design, to secure maximum economies in operation.



END VIEW OF THE PLANT

Grading and Drainage of Municipal Airports and Landing Fields

Abstract of a Report of the Committee on Airports and Landing Fields of the American Society of Municipal Engineers

IN establishing the grade of the municipal airport or landing field, particular care should be used in selecting the gradients. The limits as to maximum grade imposed by the Department of Commerce should not be exceeded unless the case is unusual. Not only this, but particular care should be taken as to the location and extent of even these maximum grades. Any other grade should also be carefully determined, with the future development well in mind. If the port is likely to be extended, this fact should be considered in determining the final elevation at the boundary of the field. The drainage of the field should also be an important factor in fixing the grade, and care should be taken to avoid heavy concentration of surface water. The grades which are fixed for the field influence to a large extent the cost of sewer construction, and the efficiency of any lighting system which may be designed, and they also determine the ease with which all parts of the field can be seen from any one place.

The airport rating regulations of the Department of Commerce specify that the area shall be approximately level and free from obstructions or depressions, preventing hazards in the taking off or landing of aircraft. This does not mean that the field should be so nearly level as to make the removal of surface water difficult, but sufficient grades should be provided to assure such run-off. Furthermore, the requirements state that the maximum slope shall at no point exceed 3 inches in 10 feet, which corresponds to a grade of 2.5 per cent. The fact that this upper limit in the grades is sometimes permitted does not imply that such maximum grades may be introduced without restraint throughout the field. A field that in its original state was covered with short, choppy hills only a few hundred feet across, would not be properly developed if these hills or ridges were merely leveled off only to the extent of the application of the maximum gradient required. Such treatment would leave the field crossed by a series of hollows and ridges, giving it a washboard surface, almost impossible to light, and unsafe for use at any time.

Effect of a Choppy Field

The character of the soil and the nature of the development plan for the finished surface will have a direct bearing on the permissible grades. If the soil is open and made up primarily of fill or gravel, with adequate subsurface drainage, the finished field might very well be, in some instances at least, practically level. The assumption in such a case would be that water would not accumulate to any serious extent during a rain, but would be absorbed by the soil at almost the same rate at which it fell. On the other hand, a non-pervious soil such as clay would increase the importance of providing the field with gradients steep enough to keep the surface from becoming soft or muddy. In such a case, the grades should not be set so that the velocity of the water causes any erosion. Ordinarily, the maximum grades are to be avoided, particularly along the line of possible take-off and landing, because these grades, when against the take-off, tend to reduce the speed of the airplane and make take-offs more difficult. In any event, they introduce hazards in landing, especially at night. The matter of design of grades is thus based in large measure on other features than the minimum cost of construction. To the extent that this is true, the engineering analysis becomes more and more important. The final profile for grades should not be accepted until it has been checked in connection with the character and location of field floodlights or runway lights. The distribution of light intensity over the field should be such that no sudden change is presented to the landing pilot. The lighted field should not present the appearance of having holes or depressions because of the uneven distribution of illumination. Provisions avoiding this are often more easily made in the landing field gradient than they are in the design of the floodlights.

Effects of Cut and Fill

The methods of making these fills and cuts vary considerably. If the fill predominates, then the material must be secured by borrowing from areas outside the limits of the airport. If cuts exceed the fills in quantity, then it will become necessary to waste the material on property outside the limits of the airport. If the amount of material needed for filling is the same as the amount of material to be removed by excavation, then neither borrowing nor waste need be resorted to and the job is balanced.

Where the amount of material removed takes away the surface soil and leaves the subsoil exposed, it may be found desirable to replace this surface soil in order to provide a basis for the growth of turf. It need not be the original soil that is replaced, but its equivalent secured at convenient available sources. If fills are to be made of any considerable depth, then an allowance must be made for shrinkage and settling. The extent to which shrinkage occurs will depend upon the method followed in placing the fill. The length of time during which settling occurs will also depend on the method of placing, the depth of fill and the character of the material. If water is available, it may be desirable to expedite the process of settling by sluicing-in a part of the material. If the fill is made in thin layers and compacted by the use of tamping rolls, and if a proper amount of water is used in connection with the roller operations, very little setting will take place after the completion of the fill. It will be

possible to finish the fill at the final grade almost immediately. The extra cost of doing this may not, however, be justified by the gain in time. Special problems are presented by hydraulic fills and in some instances by the nature of the material of which the surface is composed.

Drainage Design Data

Drainage is important, but careful consideration should be given lest money be spent for drainage that might better be spent in other ways. In designing the drainage system, the information that must be available includes the location and capacity of the outlet as well as the high and low water level thereof. It is important, and in fact essential, to know the final grade or at least the approximate final grade, to be selected for the field. The rainfall characteristic for the area should be known and the length of time allowed for the run-off period. The drainage, if designed without provision for future relief and based on a field for which no hard surface is planned, will be economical in first cost but may involve much greater expense at a later time when additional hard surface is installed, and when the increase in traffic makes it undesirable to impound surface waters for a considerable length of time or to any noticeable depths.

If the field develops beyond the capacity of the drainage system designed, by reason of the addition of extensive areas of paved aprons and runway and oiled portions of the field, it will result directly in building up ponds in the low spots. The ponds will drain more slowly as silt is washed into the low spots by the run-off and tends to seal the pores in the soil, making the removal of water by evaporation the only possible way. If such occasion arises, it may be found necessary to reconstruct the drainage system at such points and substitute for the stone-filled trenches and tile ordinarily used a catch-basin properly designed and installed with adequate outlet. The danger in having spots in the field on which water stands for any length of time lies partly in the fact that standing water softens the ground and partly in the fact that the silt deposit forms a slippery surface which has been known to cause trouble.

What is known to the engineering profession as the rational method of design is recommended. Rainfall data may be secured from the Department of Agriculture. The basis on which the design is made will vary between fields, and even between parts of the same field.

Drainage Materials and Methods

The materials ordinarily employed in subsurface drainage and sewer construction may be used. Caution should be exercised to make sure of strength to carry the loads imposed. The surface should be left in condition for safe operation of airplanes. Flat catch-basin covers should have openings that will permit a plane to taxi over without danger of catching the tail skid.

One type of drainage that has been developed, largely to meet airport requirements, is the surface intercepting drain. This is the trench with a pipe in the bottom and with stone backfill extending to the surface. The objection to the stone-filled trench is the difficulty experienced in maintaining it at the level of the field.

Good City Government at Bargain Prices

To the Editor of THE AMERICAN CITY:

It has often been said that a person gets just what he pays for. But the 5,597 persons who make up the population of the enterprising city of Hoopeston, Ill., located 100 miles south of Chicago, have had a bargain day in good government for 60 years.

The Mayor gets 50 cents a year for his services, as chief executive. Eight Alderman, who constitute the Council, receive 25 cents annually. According to tradition, the Councilmen and the Mayor frame their checks, without cashing them, so the city is not out the $2.50 for their services.

Consider Hoopeston's financial condition when many towns are broke, or nearly so, before deciding whether its citizens are getting good government at a bargain price:

Hoopeston has never had any bonded indebtedness since it was incorporated, back in 1872.

There is $21,000 in cash in the city treasury, and another $25,000 surplus is loaned to citizens at 6 per cent interest.

The tax rate is one of the lowest for a city of its size in the country, when the fact is considered that the citizens enjoy all the services furnished to residents of much larger towns.

All but a few blocks of miles of streets are paved. These streets are cleaned, maintained and well lighted out of city funds. There is a garbage collection system and a sewage disposal plant, both city operated.

McFerren Park, the largest of the three city parks, contains over 30 acres and is one of the beauty-spots of eastern Illinois. The pavilion, swimming pool, lagoon, playground, tennis courts, zoo, picnic grounds, etc., at this park are all kept up by the city.

Two fire trucks, costing over $15,000, manned by a trained company of 15 men, render excellent fire protection, and city police patrol the residential as well as the business section during the night.

The city owns and operates the water works. Although the rates charged are below average, it makes a profit each year. There was a rate reduction in 1931 and there will be another this year. New equipment to remove the last traces of iron from the water will be installed this year.

A beautiful cemetery is also owned and operated by the city.

Hoopeston has not built up its bank balance by parsimony, but, on the contrary, has merely practiced good business at all times.

When the depression hit, the Council voted a large sum of money for the United Charities relief work. A community kitchen has been established at the City Hall, where free meals and night lodgings are supplied all needy persons.

Salaries of city employees here have been reduced in keeping with the times, and so have all license fees and taxes.

If the public utilities operating in the city fail to heed the Council ultimatum for a rate reduction, the city will establish its own plant, in order to make lower rates.

Hoopeston bears the nickname "Holy City" because of its many churches and the fact that saloons were outlawed years ago and it has thrived without the revenue from licenses.

It is needless to say that the citizens of Hoopeston are satisfied with their bargain government.

M. ERNEST NINK,
Editor *Chronicle-Herald*.

Hoopeston, Ill.

An Invitation

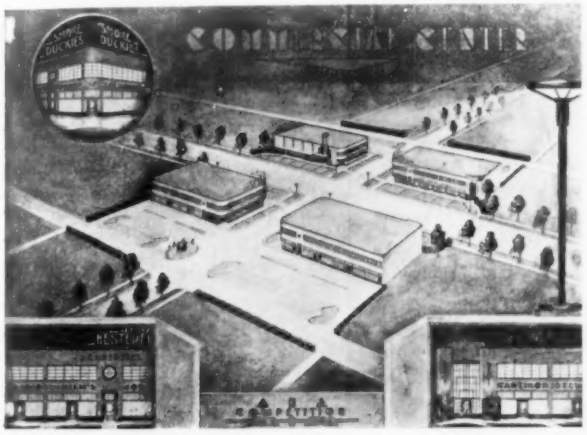
is extended to other publications in the municipal and civic field and to community newspapers to make use of material appearing in The American City, with proper credit. Cuts and photographs will be lent for reasonable non-commercial use when available.

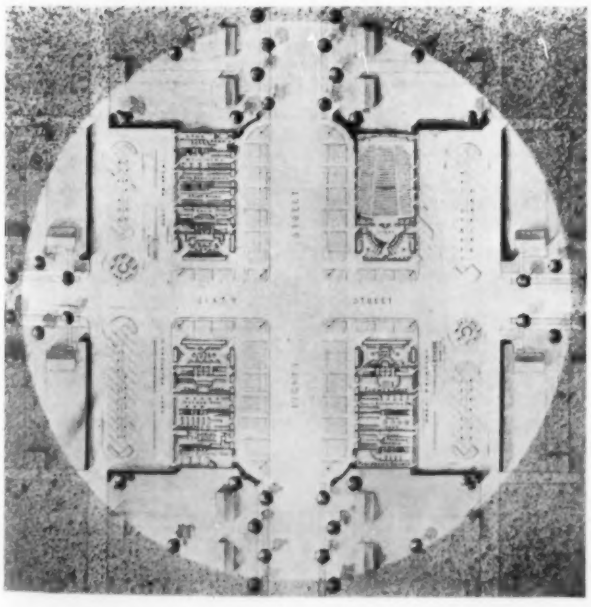
Designing a Suburban Commercial Center

By H. W. ALEXANDER
Secretary, City Planning and Zoning Commission
Louisville, Ky.

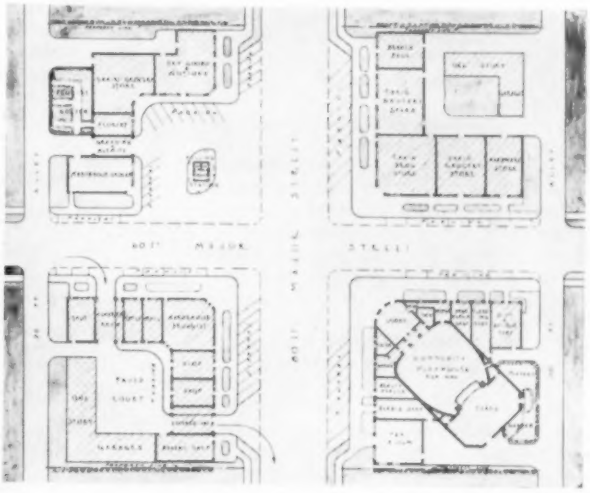
THE Kentucky Chapter of the American Institute of Architects has recently conducted a competition among its members for the design of "a suburban commercial center in accordance with the requirements of the zoning ordinance, best architectural practice, needs of the community, and modern parking and traffic conditions." The idea of such a competition was conceived by the Louisville City Planning Commission, which assisted the Institute in working out details and judging the designs that were submitted. Through the generosity of the Chairman of the Planning Commission, who is also a member of the Institute, a substantial cash prize was awarded the winner. First Place was awarded Bergman S. Letzler, who depicted a modernistic group of buildings. Second Place went to Edd R. Gregg. Both winners are connected with Louisville architectural firms.

The committee of judges consisted of two architects, a real estate man, a retail merchant, and the Secretary of the Planning Commission. Designs were judged as follows: composition (general arrangement of group), 50 points; fulfillment of parking and traffic requirements, 30; architectural design, 20. In judging, close attention was paid to the manner in which parking and off-street loading and unloading facilities were provided. The winning design handled these problems adequately. Parking space and trucking lanes were provided in the rear of the store groups, with entrances from the side street. The gasoline filling stations were located in connection with the rear parking spaces in such a manner as to make them readily accessible, but not detrimental to the appearance of the main buildings.





PERSPECTIVE AND PLAN BY BERGMAN S. LETZLER
First Place Award



SECOND PLACE TO EDD R. GREGG

Setback requirements of the zoning ordinance were observed, and the embellishment of the space thus provided lends much to the attractiveness of the groups. Practical considerations, such as the size and arrangement of different types of stores, were well handled. Some criticism was directed at the location of the theater building, the thought being expressed that provision should have been made for utilization of the main street frontage for shops. The modernistic architectural treatment was a somewhat pronounced departure from existing standards and created a favorable impression.

The winner of Second Place submitted a design that was radically different from that awarded First Place. Parking facilities were provided in front of the stores by setting back the curb, the filling station occupied an important corner, and the location of the theater made it possible to utilize the frontage on both streets for shops. The architectural design of the group made a pleasing appearance.

TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straetz, I. S. Shattuck, P. J. Stupka, Donald M. McNeil

Planting Near Street Intersections

GEORGE T. DALTON, Arboriculturist, Department of Streets and Sewers, Seattle, Wash., states that the planting of city parking strips at Seattle by individual enterprise has brought about a condition which is very detrimental to public safety.

The statistics of the Traffic Division of the Department of Streets indicate that 70 per cent of the traffic accidents throughout the city occur at street intersections or at the intersections of streets and alleys. Shrubbery or untrimmed trees adjacent to these intersections are in large measure responsible for many of these accidents.

The Department of Streets is endeavoring to make the public realize the seriousness of the existing practice of planting dense growths of shrubbery near street intersections and of permitting trees to throw out trunk shoots so that vision will be obstructed. While the city created an ordinance, a few years back, making it unlawful to have such trees or shrubs, it has been found that public sentiment has to be aroused against such practices.

Public education and cooperation are essential to the success of this undertaking, for it has been the experience that even where accidents have occurred as the result of plant growth in the parking strips at intersections, the property owners, with few exceptions, are slow to respond to notices of the Department. Where obstructions exist and an accident has not yet occurred, it is practically impossible, without exercising fully the provisions of the city ordinance, to get the abutting property owner to take precautionary measures of removing an obstruction or keeping it trimmed.

Owners of corner properties have been requested to inspect trees and shrubbery to a point at least 30 feet back from the intersecting curb and make them conform with the following specifications:

Tree trunks must be cleared of all shoots and the branches trimmed to such a height from the ground as will give full clearance and unobstructed vision to traffic.

Shrubbery more than two feet high must be removed or cut back to that height and kept so trimmed.

Traffic at alley crossings must also have a clear view, and the above instructions are applicable, and equally as important.

Keep foliage trimmed clear of traffic signs.

Incidentally, but of no less importance, cars parked on parking strips are not only unsightly and degrading to adjacent property, but constitute the same traffic hazard as shrubbery which has outgrown its space, or a heavy growth of trunk shoots on a tree.

It is emphasized that while compliance with these specifications may not eliminate accidents, it will not be a contributing cause to accidents.

The Street Department offers to interpret the meaning of clear vision and to respond to public calls on the subject of proper treatment of a tree or shrub.

Pedestrians' Associations

ORGANIZATIONS of pedestrians for the primary purpose of reducing the hazard to which pedestrians are subject, are becoming increasingly powerful in England and on the Continent, and bid fair to rival the great motoring clubs in the near future. The Verkehrswachten (Traffic Vigilantes) of Germany and the Pedestrians' Association of England are two of the outstanding groups of this character.

The Pedestrians' Association of England was formed in October, 1929, with Viscount Cecil, P.C., as President. Membership fees are one shilling per year upwards. An annual subscription of five shillings entitles members to copies of all literature published by the Association.

Some of the objects of the Association as set forth in the Constitution are:

(a) To insure the safety of the public generally on the highways and elsewhere, and to protect and preserve the rights, freedom, comfort and general amenities of pedestrians.

(b) To enforce existing legislation and to promote, support or oppose any legislative or other proposals which may affect the interests of members of the Association.

(c) To take active part in all lawful propaganda in the interests of the members of the Association.

(d) To give legal or other assistance to members of the Association and members of affiliated organizations where the interest to be promoted is, in the opinion of the Committee, a common interest.

(e) To provide facilities for arbitration of any matter affecting the interests of members.

The present policy of the Association, as summarized in the Third Annual Report for the year ending December 31, 1931, contemplates active support of the following measures in 1932:

1. Improvement in speed laws and their enforcement.
2. Construction of sidewalks along country roads and pedestrian isles of safety in urban areas.
3. Enactment of a drivers' license law.
4. Greater uniformity in dealing with traffic violations through the establishment of special traffic courts.
5. Compensation to be payable (as in France and other Continental countries) for injuries caused by motor vehicles, irrespective of negligence on the part of the driver.
6. An exhaustive survey by impartial persons as to the causes of road accidents and the most effective way of reducing their number.

Night Parking Surveyed in Washington

A RECENT check by the Police Department of automobiles parked on the streets of the District of Columbia between 2:00 A.M. and 6:00 A.M. shows 57,970 cars not garaged at night. This represents more than 40 per cent of the total number of motor-vehicle registrations of the District.

The Department of Vehicles and Traffic, under William A. Van Duzer, Director, is now planning to amplify this survey by making a count of garages and parking lots to determine whether existing off-street storage facilities are adequate to accommodate all cars, should an all-night prohibition on parking be enacted.

Street Traffic Research of the Bureau of Public Roads

THE National Conference on Street and Highway Safety has recently issued the following summary of the suggestions for needed research on problems dealing with safe and orderly traffic movement received from traffic authorities throughout the country. The conference had previously summarized the suggestions dealing with measures for increasing street traffic capacity. The actual research is being conducted by the Bureau of Public Roads, cooperating with the Conference.

"*Road Construction Details.*—(a) Relation of roadway design to safety; (b) elimination of sharp curves on country highways to increase visibility and eliminate collision hazard; (c) widening of narrow bridges to provide safe clearance for passage of vehicles going in opposite direction.

"*Signs and Markings.*—(a) Studies to determine the relative merits of various systems of signs and markings with special reference to night conditions; (b) investigation of different types of traffic signs with respect to attention-arresting qualities; (c) standardization of traffic signs and markings to eliminate present confusion due to lack of uniformity.

"*Vehicle Details.*—(a) A thorough study of the problems of automobile lighting, combining laboratory and road tests to determine reasons for lamp failures; (b) determination of proper standards of performance of modern vehicle brakes and factors affecting their operation; (c) studies are needed on tires in relation to accidents . . . the point at which they become a hazard, the relative safety of four-, six- and eight-ply tires, etc; (d) equipment tests to determine the relative merits of various types of mechanical signaling devices; (e) consideration of vehicle dimensions as a function of traffic safety.

"*Speed Regulations.*—Study of various types of speed regulations in force in the different states with a view to determining effect on accidents.

"*Traffic Movement Regulations.*—(a) Investigation of the advantages and disadvantages of the practice of permitting turns on the red signal; (b) determination of merits of one-way streets; (c) establishment of a measuring stick upon which to base the elimination of left turns.

"*Pedestrian Protection.*—(a) Determination of proper basis for establishment of pedestrian control; (b) analysis of ways and means best suited to the handling of pedestrians at signalized intersections of various types.

"*Accident Causes.*—(a) Standardization of exact terms to provide uniform classification of primary and contributing accident factors; (b) experimental road sections in different parts of the country to measure relative efficiency of various traffic safeguards; (c) determination of the relation of highway lighting to night accidents; (d) a case study of rural highway accidents to ascertain the important circumstances of such accidents.

"*Miscellaneous.*—(a) Enumeration of engineering principles known to have been effectively applied to the reduction of traffic accidents as well as expedition of traffic; (b) development of engineering principles that may be generally applied; (c) finding better safeguards against hazards presented by fog, smoke and mist; (d) the development of 'specifics' for the treatment of definite points on traffic troubles."

Stop Signs Reduce Accidents in New Orleans

STOP signs are reducing accidents on main thoroughfares in New Orleans. On five streets, from June 1 to December 31, accidents were reduced from 123 in 1930 to 83 in the same period in 1931. Motorcycle police check the more important intersections and continually vary their checking locations. It is felt that the vast majority of the motorists obey the signs.

Fright Period

DURING a 30-day test held in Munich, October 15-November 14, 1931, it was unquestionably established that many motorists are subject to a period of fright which in most instances is caused by the threat of an accident and which considerably delays their action to stop the automobile.

Almost every driver is subject to this mental reaction, and this can be avoided only by exercising the strictest attention to the prevailing conditions. Generally, the whole procedure of action may be classified into four periods:

1. Fright period
2. Reaction period
3. Action period
4. Operating period

The first period varies considerably, dependent upon attention, experiences, etc., and can be avoided by close attention and concentration. The second and third periods are unavoidable and vary considerably, depending upon the mental efficiency of the driver and the necessary time to start the operation of the mechanism. The average aggregate time consumed by both periods averages one second. The fourth period depends upon the mechanical condition of the brakes, weather, pavement, etc.

The practical result of this exhaustive test may be summarized as follows: Approaching an intersection at a speed of 30 miles per hour with an automobile in excellent mechanical condition, this should be stopped within 76 feet. Since at such speed the distance covered per second is 51 feet, it is necessary to get into action about 127 feet ahead of the intersection or source of danger ($2\frac{1}{2}$ seconds) allowing the equivalent of one second for the reaction and action periods.

According to the Munich experiments, however, the average additional distance covered amounted to 12 feet, which in some extreme instances proved sufficient to cause an accident before the brakes were set to operate. This is caused by the fright period.

To reduce its effect to the minimum, it is suggested that drivers be examined carefully to establish their general nervous reaction and that they be accordingly instructed. In the interest of safety, certain rules should be enforced, like an ordinance of the city of Vienna which prohibits the driver from talking with other passengers of the car; also another ordinance which restricts the driver from smoking, to concentrate his attention upon the road. Such rules are in use by some bus companies in the United States.

Traffic Survey of Buenos Aires

IN an able and concise report Jacobo Stok, civil engineer, points out the major problems of traffic in the largest city of South America. Although having only about 50,000 motor vehicles in a city with a population of 2.2 millions, Buenos Aires presents a typical aspect of the congested American city. This is mostly due to the very narrow streets of the downtown district into which crowd most of the people during the day, with the traffic entering in the morning and leaving in the evening. During the day, the streets are clogged with parked automobiles to the extent that some thoroughfares become entirely unpassable.

Based upon the number of motor vehicles, the rate of accidents is very high, amounting to 7,547 accidents in 1930, of which 255 were fatal. By far most accidents happened in the middle of the block, and only very few were caused by excessive speed.

The loss in motor hours is calculated to cause an annual loss of about $17,000,000 (40 million pesos).

The report suggests the establishment of a traffic commission to work out a traffic plan for Buenos Aires and the federal district.

Cost of Traffic Police vs. Traffic Control

IT has been reported in *The Surveyor* (English), May 6, 1932, that in the (London) Metropolitan Police District 1,500 policemen out of a total of 20,000, or $7\frac{1}{2}$ per cent, are assigned to traffic duty at a cost of £500,000 per year. It is estimated that the *capital* cost of a traffic signal is roughly about the same as the *annual* cost of one policeman, and a greater use of traffic signals is recommended.

Institute Board of Direction Meets

THE Board of Direction of the Institute of Traffic Engineers met in New York on May 14 to consider membership applications, arrange for the program of the third annual meeting and transact other business.

Five applications for admission were passed upon; two applicants being elected:

MEMBER: William A. Van Duzer, Director of Vehicles and Traffic, District of Columbia, Washington, D. C.

ASSOCIATE MEMBER: William G. Eliot, 3rd, Associate Highway Economist, U. S. Bureau of Public Roads, Washington, D. C.

It was voted to hold the 1932 meeting in Washington, D. C., on Thursday, October 6, during the week of the National Safety Congress. The morning session will be devoted to presentation and consideration of committee reports and members' papers. The annual business meeting will be held at noon. In the afternoon there will be a joint session with the Street and Highway Traffic Section of the National Safety Council. Papers on subjects of general interest will be presented at the afternoon session. In the evening the annual dinner will be held.

The Christmas Club Plan for Paying Taxes

RECENTLY legislation was enacted permitting taxpayers of Detroit, Mich., to pay taxes in advance instalments; but as this would throw a heavy burden on the City Treasurer's accounting system besides requiring frequent trips of taxpayers to the City Hall, a special committee of the Council made arrangements with the Detroit banks to handle the payments. As explained in *Just a Minute*—, the leaflet of the Detroit Bureau of Governmental Research, "These institutions have for many years maintained Christmas clubs, whereby a member makes a weekly deposit, the accumulations of which are returned with interest at the holiday season. Ordinarily 115,000 individuals participate in this plan." One of the Detroit banks had also initiated a similar taxpayers' club three years ago; and its success suggested that like facilities be made available to all the taxpayers.

Under the plan adopted, each depositor in a Taxpayers' Savings Club agrees to make 50 weekly payments (or other types of instalments) of a specified amount within the year, the total to be the estimated amount of his taxes. Interest at 3 per cent is paid on completed tax club accounts. The depositor may withdraw the balance of his account upon the completion of the club on June 30, 1933, thus being enabled to meet his tax bill, which he will have received by mail.

Portsmouth, Va., has a new optional instalment tax-paying plan, devised by City Manager Frank C. Hanrahan, whereby property taxes may be paid in advance in weekly, semi-monthly, monthly or semi-annual instalments, at the taxpayers' convenience, to the city collector, who credits their tax bills accordingly. These payments receive 6 per cent interest, which is deducted from the amount still owed at the end of the tax year. Depositors are given tax deposit books similar to Christmas savings bank books. In the first 30 days, $100,000 was produced. The plan is described in detail in the *Virginia Municipal Review* for May.

FORWARD STEPS

Reported by

Municipal Officials, Chamber of Commerce Executives, and Others

New Package Freight and Passenger Terminal of the Port of Rochester

ROCHESTER, N. Y.—Early in June the first unit in the port development plan of the Port of Rochester, located just inside the jetties on the west bank of the Genesee River, at Charlotte, was completed, at a cost of approximately $500,000. The new terminal, located about seven miles from the center of Rochester, is being constructed by the city, with MacElwee & Crandall, Inc., of Cambridge, Mass., as designing and supervising engineers.

The terminal consists of a 1,200-foot dock wall of the high foundation relieving platform type, resting upon three rows of bearing piles and a curtain wall of deep arch sheet piling, driven to minus 35 feet mean water level. The concrete is set to 6 inches below record low water of Lake Ontario, plus 244 feet. The wharf elevation is plus 254 feet.

The terminal is provided at the north end with four drop or floating gangways, and at the south end with three. These sideport drops are on 48-foot centers and make provision for variation in deck and water levels, in sideport discharge and loading. The middle two berths of the terminal allowing four 300-foot berths, are for car ferries, discharging passengers, for self-propelled barge canal-lake barges, and ocean charters, mostly under the Scandanavian flag, from overseas, through the present St. Lawrence Canals, as well as for lake type and inland freighters, of which a number are in service on the Great Lakes.

The cross-section shows a 30-foot wharf apron, carrying mooring bollards, crane rail, two railroad tracks, transit shed, 261 feet long and 120 feet wide, a covered loading platform 20 feet wide at the rear of the transit shed, and two car tracks, of which only one has been installed to date. The terminal tracks are within the reciprocal switching limits. The ends of the transit shed are provided with six tailboard loading platforms for motor trucks. The second floor of the transit shed carries a veranda the full length and has a raised middle section 100 x 140 feet, providing Port Manager's offices, ticket offices, customs and immigration facilities, immigration and customs detention rooms, special waiting rooms for men and for women, and a large central concourse for the general public, also concessions for luncheonette, telegraph, telephone and newsstand.

The twin passenger gangplanks are carried by a semi-portable gantry to reach the promenade deck of car ferries and excursion vessels from the passenger deck. This makes it possible to separate the passengers from the activities of the main cargo deck. A bridge over the car-loading platform and rails connects the passenger facilities and the curbing for automobile service at the rear of the transit shed. Plans eventually call for a row of warehouses, 160 x 100 feet, parallel with the transit sheds. At the present time this area is to be used as an automobile parking space.

The annual passenger traffic between Rochester and Canada, via car ferries and the Canada Steamship Co., is between 75,000 and 90,000 persons. It is expected that with the improved facilities and greater convenience this traffic will increase materially. The trip across the lake is 250 miles shorter than going around the ends of the lake by road or railroad.

The full design of the terminal calls for three transit sheds, but the initial project provides only the midde transit shed with the passenger accommodations on the second floor, with provision made for the erection of the two single-story sheds to the north and south, as soon as business warrants.

Specifications call for crawler cranes for transfer of cargo to and from motor barges and top hatch vessels. High-powered electrical material-handling cranes of the platform lift type, with various attachments for handling specific types of merchandise, are specified; also portable scales. The transit-shed doors are 10 feet wide and 14 feet high, to permit the use of the modern electrical crane truck for handling and stacking.

The contractors for the dock wall were I. M. Ludington & Sons; for the transit shed, Stewart & Bennett, both of Rochester; and for the dredging, Dunbar & Sullivan, of Detroit. The dock wall was built in a trench, 70 feet back of the old river bank, in the dry. Later the berths were dredged to minus 22 feet. The Federal Government is to dredge a turning basin in front of the terminal and will widen the entrance channel by 100 feet and deepen it to 22 feet.

This terminal will be the most modern on the Great Lakes.

R. S. MACELWEE.

PART OF NEW FREIGHT AND PASSENGER DOCKS, ROCHESTER, N. Y.
Passenger railings not yet installed on upper level

Fire Prevention Work Reorganized and Intensified

DALLAS, TEXAS.—This city is making an intensive effort to reduce losses by fire. As the first step in this campaign, the Fire Prevention Bureau and the Fire Department were consolidated and completely reorganized. An active Fire Prevention Commission, composed of local business and professional men, has been appointed and is engaged in a continuous drive for the elimination of fire hazards uncovered by periodical inspections of all premises in the city. All members of the Fire Department participate in the inspections.

Poster contests in the schools, talks before luncheon clubs, civic leagues and over the radio, window displays and newspaper publicity are among the devices used by the Commission to focus attention upon the prevention of fire.

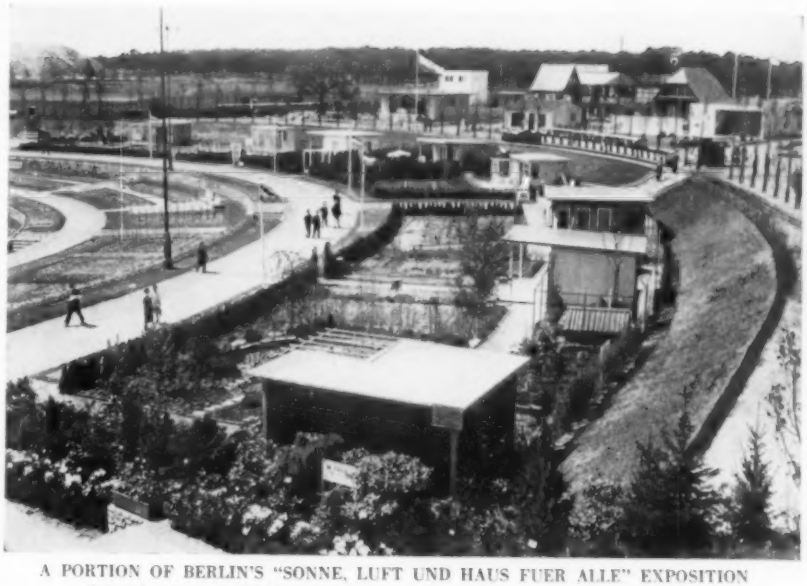
Inspectors operating under the direction of the Fire Marshal attend every fire

and attempt to determine its cause. Because incendiarism flourishes under Texas laws, an especial effort to combat it is necessary and an Assistant District Attorney is permanently assigned to full-time duty with the Fire Marshal in making and prosecuting arson cases.

The fire-fighting forces receive instruction in daily schools and drills in efficient methods of combating fires, and a new drill tower has been constructed for that purpose. Instruction is also given in first aid and in salvage work, although two well-equipped salvage corps are on duty at all fires. Morale and discipline have been increased by the adoption of semi-military regulations governing conduct of the members of the department, and of a merit system for promotions.

The beneficent effects of this whole movement are readily discernible in the fire loss ratio, which is steadily declining in spite of over-insurance, low property values, business failures, foreclosures and all of the other factors which ordinarily would tend to increase incendiarism and wilful carelessness.

DAVID L. ROBINSON, JR.,
Assistant City Plan Engineer.



A PORTION OF BERLIN'S "SONNE, LUFT UND HAUS FUER ALLE" EXPOSITION
Part of section of Schreber gardens in the terrace garden oval of the exposition

Houses, Gardens and Week-Ends

BERLIN, GERMANY.—"Sun, Air and House for Everybody"—is the official caption for this year's main summer event on the great Berlin exposition grounds, where the important has long since become the rule and the mediocre is unknown. For a subtitle, they have called the 1932 affair "An Exposition for the Growing House, the Small Garden and the Week-End."

One must know conditions in Germany to realize the importance of this exposition for the social and physical welfare of the large-city dweller in Germany and particularly the Berliner. One must have experienced the longing of these people of small means for the simple life of nature without the heavy trimmings of an over-civilization and without the life-and-death fight of competition caused by it, all with the strong sense of individuality so characteristic of the German. One must understand all this to realize the meaning and the magnitude of this undertaking by the city of Berlin. It was very appropriately inaugurated by a speech by Gerhard Hauptmann, the great dramatist of the misery of the masses.

"The Week-End" needs no explanation. The systematical mind of the managers has divided this part of the show into the three sub-sections — "Week-end — Why?", "Week-end—how?" and "Week-end—where?", which are spread over nearly 200,000 square feet of closed exposition space. Everything pertaining to week-ends and week-ending is on display here, from the most practical shoestring to the medieval castle that serves as a hikers' inn. Quite logically, the German Railroads Company, with its 33,000 miles of track and its recent great increases of train speed, is deeply interested in the promotion of week-end travel, and therefore one of the most prominent participants in this section of the exposition.

The "Small Garden," or "Schreber Garden," which recently has had much attention in magazines and among social workers in the United States, is the subject of the second section of this Berlin Summer Show. It is the outgrowth of a movement that started, in its systematic application and on an enlarged scale, about the middle of the nineteenth century in Leipzig, where the physician Dr. Daniel Schreber preached and promoted the building of "Lauben," or little garden huts, on plots outside the city stone piles, there to spend every available free hour and, of course, the week-ends. There are many stretches of such small garden colonies outside the gates of large German towns. The movement has grown so that today it forms an important part of the social and hygienic developments in the country. Here again, the why and wherefore and how of the theoretical and practical side of the movement is shown, on sample lots, together with all the implements for the "small garden building."

More than 20 garden lots from 50 to 55 feet square have been laid out, each with a little fully equipped garden house. They are made to suit various purposes and inclinations—those of vegetable fanciers, of families with many or few children, of flower or animal lovers, and those of the more leisurely inclined who, in the language of the exposition, are plainly called "Faulenzer," which means lazy-bones.

Perhaps most characteristic for the trend of developments in Germany is the third section, devoted to the "Growing House." It is peculiar to the Germany of the post-war period, and particularly of the last few years—the Germany of very small means and the urgent desire to make up through simplicity and frugality what it lacks in luxury and wealth. The name of the thing should rather be the "growable house," because the idea is to build a house of very few or even only one room, to which, without spoiling the esthetic effects or the practical use of it, units can be added from time to time, as demand requires or the purse permits. One may get an idea of the simplicity of these houses from their price for the initial unit: 140 marks (approximately $33) up. Quite naturally, these houses are to a large extent standardized. No less than 30 of them, of natural size and massive construction, are being shown.

A surprise for visitors at the great Berlin exposition grounds this year is a new terrace garden which provides opportunities for recreation or entertainment that heretofore were lacking. The terrace garden consists of a large oval, of diameters of about 900 and 550 feet. It grades down in four terraces, leaving in the center a grass plot oval 360 feet long. During the exposition, sports, dancing and other performances, riding and driving tournaments, games, hockey, fencing, gymnastics and other contests are held here, for the good of the participants and the entertainment of the visitors. The exposition will be open until the first part of August.

H. PORTACK.

The Unemployed Employ Themselves

VENTURA, CALIF.—A group of unemployed citizens of Ventura, recognizing the abundant resources at hand, are proving that they need not remain dependent on charity, but can take care of themselves and help others to do likewise.

There were many worthy unemployed in this city who could not get help from the established welfare funds because of the restrictions governing existing relief agencies. Thoughtful ones studied out how to serve meals and get the idle working at something that would eventually lift them out of the dependent state. Obtaining the use of some vacant store buildings and a partly furnished vacant restaurant, the participators carried their own food there, so that all might share

alike, and went to work cleaning the places. The restaurant they named Community Kitchen, and it is headquarters for all their activities, which go under the general name of Community Center.

In Ventura rich soil, frostless winters and foggy summers all help to make ideal conditions for growing crops all the year round. The Center solicits the use of vacant lots, agreeing to clear away weeds and improve the looks of the place by planting and cultivating a vegetable garden on it. A city ordinance makes lot cleaning compulsory, and the workers do this at a nominal price. Any person unemployed and in need may have the privilege of farming his lot under the plan. The city gives the Center water for use on all its garden lots. The Center furnishes the worker with free seed and water, providing he cooperates with the Center and does not use his crop as a commercial venture. Each man given a lot to farm must keep it neatly tilled throughout his agreed farming period. There are 142 lots farmed by the workers, 125 of which are already planted to vegetables. In season the Chamber of Commerce gives poinsettia slips free to whoever will plant them, in order to maintain the city's claim to the name of The Poinsettia City. Cooperating with the Chamber, the Center requires its workers to plant poinsettia slips inside the curb along the street side of every lot they use.

Rich oil fields to the north and west of Ventura once employed many workers who made their homes in Ventura. Two years ago the companies began cutting down their help, and now there are many vacant homes. Kindly owners give needy families free rent for the upkeep of vacant places, well aware that they lose nothing by this cooperation with the Center. Single people are fed at the kitchen, and those with families are given food supplies to take home. The Center requires some sort of service from every one cared for; work is allotted according to each one's ability.

The Community Kitchen served 4,033 meals during the first six weeks of operation, at a total cost, to its workers, of $96.65. It also dispensed food to destitute families, in connection with the Welfare Department. At meal time every hungry person is fed who is willing to work under the plan. Donations of unsalable foods from merchants and ranchers are collected and salvaged, thus keeping the cost of food less than 2½ cents per meal.

The workers accept anything of value in payment for their labor for outside employers—it may be clothing, furniture, fruit, vegetables, plants, etc. When it is something the worker cannot use, he takes it to the Community Center and exchanges it for service tickets, which are redeemable only at the Center and for the necessities of life. With these service tickets the worker may buy at the Center from time to time meal tickets good for meals only at the Center, tobacco, clothing and furniture suitable for his needs, etc. Cash received for services rendered an outsider belongs to the worker, and with it he may buy from stores; usually he shares his earned cash with the Center, but this is entirely voluntary. Few outside donations of cash have been received; say, $20.40 at date of writing.

The Community Center has no license and is not lawfully entitled to hold property in its name; therefore, whatever service tickets are in hand at the end of the week must be divided among the workers by agreement among themselves, so that over the week-end the Center is not possessor of anything. This weekly division will have to be kept up until the Center becomes an official organization. Business men and city officials are now making investigations, seeking to find the best arrangement for the future of this undertaking. As soon as any worker finds steady work with pay, he is free to leave the Center. This means a continuous change taking place through the office. So far no books have been kept, the service tickets being used as the record of workers' credit.

Here are some of the things for which the workers have exchanged labor: 1 cow, 8 pigs, 24 chickens, 3 ducks, 1 rabbit, 30,000 tree seedlings, 102 budded trees, 100 pounds of avocados, oranges and grape fruit, 5,000 tomato plants, 6,000 sweet potato plants, 475 eggplants; 200 small cypress trees, which will be planted and sold or rented for Christmas trees unless suitably marketed before then. The workers have contracted with a rancher to do the work on a 100-acre garden for 25 per cent cash and 75 per cent in produce ready for market.

Emergency relief has been given by the Center to many destitute families, and the needy have been supplied with donated garments and shoes which the women workers had cleaned and mended. The family spirit of cooperation prevails throughout the group.

Plans are progressing for a cooperative market, similar to the one well established in Los Angeles, where produce can be sold or exchanged. It is estimated that 50 tons of foodstuffs will be garnered from the Center's lots this year. At present, the Community Center, through the cooperation of the country merchants, will provide proper marketing of the surplus grade products, and the remainder will be distributed by the Center through the community kitchen and the Welfare Department. Gardening advice is given by the Farm Adviser's Office, and bulletins on planting and marketing problems are provided from this source. Adult evening classes in agriculture are to be held at the Center under the direction of the County Farm Adviser's Office.

R. F. J. MILLER,
Manager, Community Center.

Relief Gardens

THE Temporary Emergency Relief Administration of New York State has in progress a plan of "subsistence gardens" by which unemployed families who are now being supported by city and state tax funds may grow vegetables to support themselves partially. Harry L. Hopkins, Chairman of the Administration, wrote to the city and county governments that the state would contribute 40 per cent of the cost of seeds and tools for the gardens and would also approve as a "work relief" project the fitting of the land for this purpose. There will be no competition with truck gardening. Thirty-three city governments and 13 county governments have begun the gardens. Vacant land has been generously contributed for the work. Rochester, Syracuse, Utica, and Glens Falls are among the pioneers.

Recent City Manager Appointments

E. C. JONES, President of the City Council, Ocala, Fla., was appointed City Manager of Ocala on June 1. John M. Martin had served that city since 1928.

Fred Macready has succeeded C. W. Ten Eick as City Manager of Hollywood, Fla. Mr. Ten Eick was appointed to that position in 1930.

Harold C. McClintock, Director of Public Works in Boulder, Colo., was recently appointed City Manager, to succeed George W. Teal, who died on May 31.

CLARENCE E. RIDLEY,
Executive Director, The International City Managers' Association.

The Municipal Bond Market

THE following is a representative list of recent sales of new issues of state and municipal bonds, taken from current issues of *The Bond Buyer*:

Amount	City or Other Public Body	Rate (%)	Maturity	Net Basis (%)
$ 335,000	Worcester, Mass.	4	7½ (avg.)	3.71
1,000,000	Maryland	4½	9½ (avg.)	3.89
2,000,000	Maine	4	13-22 (ser.)	4.04
300,000	Wright County, Iowa	4½	5-7 1/3 (opt.-avg.)	4.31
163,096	Topeka, Kans.	4½	5½ (avg.)	4.40
300,000	Pittsburgh, Pa.	4¾	1-15 (ser.)	4.43
300,000	Kansas City, Mo., Sch. Dist.	4½	15	4.45
18,000,000	New Jersey	4½	22½ (avg.)	4.49
180,000	Vallajo High Sch. Dist., Solano Co., Calif.	4½	11¾ (avg.)	4.50
4,000,000	Buffalo, N. Y.	4.70	5	4.68
295,000	Multnomah Co., Ore.	5	6-15 (ser.)	5.00
6,836,000	San Francisco, Calif.	5.26	23.8 (avg.)	5.26
1,403,372	Hamilton Co., Ohio	5.46	5.6 (avg.)	5.45
1,100,000	Lowell, Mass.	5¾	1-10 (ser.)	5.75
450,000	Cleveland, Ohio	6	11 5/6 (avg.)	5.99
1,280,673	Harrison, N. Y.	6	10.3 (avg.)	6.00
1,016,000	Bayonne, N. J.	6	16.6 (avg.)	6.00
1,768,000	Montclair, N. J.	6	12¼ (avg.)	6.15

Electrical Map Aids Fire Department

By C. C. RALPH

Acting Superintendent of Fire Alarm Telegraph, Portland, Ore.

THE Fire Department of Portland, Ore., is equipped with an electrical map, the object of which is to give the fire-alarm operator or dispatcher a visual picture, at all times, of the location of (1) all fires; (2) nearest available apparatus; (3) apparatus out of service; (4) move-up companies during greater alarm; (5) battalion chiefs; (6) auto mechanic.

Flexibility is made possible by the unique construction of the map. A piece of plate glass with a white line city map on the inside forms the base to work from. This glass is placed in a steel sash frame which is hinged to another frame in which are placed all the lights, wiring, cable terminals, etc. The outside or face of the glass is clear and has no lettering on it. As all equipment is behind the white line print, nothing is visible but the map seen through the glass.

Engine and truck companies are geographically located and designated by the company number. For truck companies the number is in a square, for fireboats it is in a circle, while for engine companies the number is used alone. A cluster of one red, one green and one white lamp is set directly behind each number. A piece of one-inch bakelite tubing is slipped over the cluster to shield the light from other numbers.

Fire location lights are distributed behind the map and are spaced according to scale and indexed by numbered lines in one direction and lettered lines in the other. The lights are arranged in rows corresponding to these lines and a light lit at the corresponding crossing of a number and letter will give the approximate location of the fire.

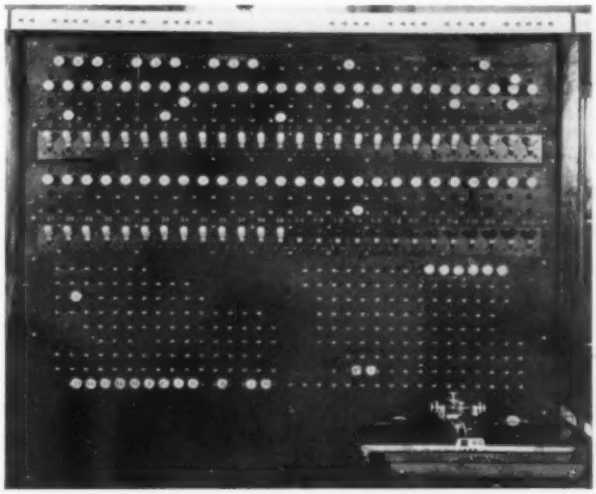
The light itself will show through the black map with a dull orange glow making a spot about two inches in diameter. The operator can tell at a glance the nearest companies in service and dispatch them to the fire.

The control panel is a combination map control, plug-out board and station selector that we use with our card transmitter. Each station number on the map can be made to turn either red, white or green. If a company is out of service, its button is pushed and the company number turns red on the map. If the district chief is at a company, the chief's plug is inserted in the hole for the company's plug and the number on the map turns white. If a move-up company occupies a house, that company's plug is inserted in the second hole below the number the company is moving into and the number turns green. When there is no light, the company is at quarters in service.

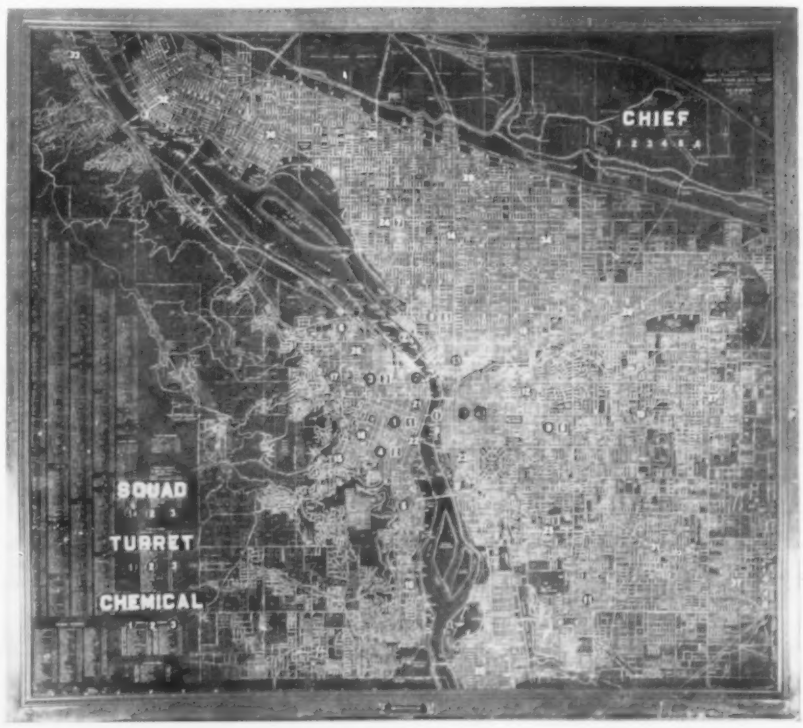
The plugs in the panel can be moved to any hole, just like a standard plug-out board. This panel is designed for 39 engine companies, 10 trucks, 3 fireboats, 3 chemicals, 3 turrets, 3 squads and 6 battalion chiefs. The fire location light holes are on the lower part of the board. The telephone keys are station selector keys and are used for a broken running card on the card transmitter or to tap out any house individually.

Portland does not have a night watch. From 11 P. M. to 7 A. M. we are under the silent system. If a box comes in, the operator selects that running card, drops it in the card transmitter and pushes a lever. The transmitter selects the companies answering the box, taps out the companies by ringing the alarm gong in the station, sets up the box number automatically and sends it to the companies that go. The rest of the department sleeps on until, in the judgment of the operator, a watch should be maintained. The operator then throws a switch and the transmitter simultaneously rings the tap-out or alarm gong in all stations, followed by 2-1-3 on the tape, which is a signal to put a man on watch. The operator then sends out what boxes are in and reports all companies out on telephone calls. The man on watch arranges his plug-out board and stands watch until the signal 3-1 comes over the tape, which means that the danger is over—turn in.

The map, control panel and transmitter were designed and built about a year ago by a member of the Portland Fire Department.



THE ELECTRICAL FIRE MAP OF PORTLAND, ORE. (BELOW), AND ITS CONTROL PANEL (RIGHT)



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Bitumuls penetrates any depth of material, thoroughly coating each particle with pure refined asphalt; binding the mass together, and consolidating it permanently with the pavement.

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Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Garage—Residential District

KENTUCKY.—*Standard Oil Co. v. City of Bowling Green*, reported in *U. S. Daily*, June 8, 1932.—The zoning ordinance forbidding the use of a garage on the lot in question, in a residential district, is invalid as to the appellant.

NOTE BY EDITOR.—This decision is contrary to the weight of decision on this point.

Zoning—Reasonableness—Implied Repeal

LOUISIANA.—*Bultman Mortuary Service, Inc., v. City of New Orleans*, 140 So. 503.—The provision in a zoning ordinance prohibiting mortuary establishments except upon express permission of the Commission Council, and prescribing no standard or rules for granting or refusing permits, is violative of the equal-protection clause of the Constitution because it places it within the power of the Council to grant or withhold permits in the exercise of its administrative powers according to its whim or fancy, thereby placing itself in a position to display favoritism by granting its consent to one while refusing it to another under similar circumstances.

A comprehensive zoning ordinance which, an unconstitutional provision being eliminated, permitted mortuary establishments in a district, impliedly repealed ordinances partially or entirely prohibiting such establishments in the district.

Garage—Estoppel

MISSOURI.—*Green v. Spinning et al*, 48 S. W. 2d, 51.—Residents of a city can complain of the noise of automobiles at a business location as nuisances only in extreme cases. A gasoline filling station within 50 feet of a residence is not a nuisance because of noise, smell, etc., resulting from its operation in the usual manner, nor because of depreciation of the value of adjoining property, nor as constituting a fire or explosion hazard; but if so constructed that the lights of automobiles stopping for gasoline at night shine directly into sleeping rooms of a house a few feet away, it is a nuisance.

Landowners not complaining of the erection of a filling station on an adjoining lot without their consent are not estopped to complain of it as a nuisance after unexpected increase in business.

Zoning Ordinance—Nuisance

NEW YORK.—*Bove v. Donner-Hanna Coke Corporation*, 142 Misc. 329.—The complaint for an injunction restraining the defendant from so operating its coke plant as to allow smoke, soot and gas to pass over plaintiff's premises in the city of Buffalo, and for money damages, must be dismissed where the district in which the plant was located was predominantly devoted to transportation, traffic and heavy industrial plants when the plaintiff acquired the land; the location and the use of the plant are in a district expressly sanctioned by the zoning ordinance of Buffalo and there is nothing to show that the operation, construction and maintenance of the plant constitute a nuisance, particularly since the condition of which complaint is made is general and cannot be charged directly to defendant.

The fact that the defendant is under a contract with the United States Government is no defense to this action where there is nothing to show that the method and manner of operating the plant has been specified or authorized by any legislative enactment or governmental decree.

Zoning Residential Districts—Old Ladies' Home

MISSOURI.—*Women's Kansas City St. Andrew Society v. Kansas City, Missouri*; Circuit Court of Appeals, Eighth District, reported in *U. S. Daily, May* 14, 1932.—This case, in the District Court, was reported in these Notes for February, 1932. The ordinance placed institutions such as the Old Ladies' Home in question, in class U 7, comprising cemeteries, sewage disposal plants, aviation fields, philanthropic institutions, hospitals, etc. It allocated no special territory for these uses, but allowed them, on appeal to the Board of Appeals, "in any use district, provided such location will not seriously injure the appropriate use of neighboring property," thus excluding them from residential districts, in one of which it was sought to locate this Home, except by discretionary action of the Board of Appeals. The Court below held this provision valid; in the upper Court that decision was reversed.

In its decision the Appellate Court cites with approval the case of *Village of University Heights v. Cleveland Jewish Orphans' Home*, 20 Fed. 2d, 743, allowing such a Home to be erected in a residential district, quoting the following passage from the decision in that case:

"We can see many valid reasons, affecting the public welfare, which would justify the exclusion of factories, business houses, shops and even apartment houses from strictly residential districts, but which would not apply to the use of structurally proper cottages for an orphanage; and while an orphanage would no doubt be less agreeable to the community in some respects than a private school or private residences, we are unwilling to hold that it is within the power of the village to prohibit the use of cottages of this character for that purpose."

The Court goes on to say:

"It would seem that the objections are not so much that the intended use of this Home really interferes with a zoning plan supposed to benefit the entire city, but rather because of the feeling which the people of a particular section have against an eleemosynary institution of this nature being located in such an area. The restriction complained of goes to the extent of determining who shall occupy for residence purposes a residence that meets in every respect the requirements of the . . . . residence district. This would seem to go further than the police power has ever attempted to go in these zoning ordinances, except possibly the Roberge case."

The Roberge case (*Washington ex rel. Seattle Title Trust Co., Trustee, v. Roberge, Superintendent of Buildings of Seattle*, 278 U. S. 116) seems to be an authority in favor of the principle sustained by this case and is certainly not considered contrary to it by this Court, or it would not have decided this case as it has decided it.

The Court says further, "If there is no base for restriction as to color or race or as to an orphan asylum," referring to *Village of University Heights v. Cleveland Jewish Orphans' Home*, 20 Fed. 2d, 743, "how can a discrimination based on age or poverty be sustained?"

Garage—Residential District

PENNSYLVANIA.—*Yeager (Young et al, Intervenors) v. Traylor*, 160 Atl. 108.—The Court properly enjoined the proposed construction of an open-air parking place with uninclosed floors and roof for the use of hotel patrons and apartment house tenants in a strictly residential district; but the owner of an apartment hotel in a residential district should have the privilege of erecting a properly built, enclosed parking garage suitable to the requirements of permanent tenants, and to be used by them exclusively.

Zoning and Planning Survey of U. S. Department of Commerce

The Department, under date of April 8, 1932, has issued three surveys: the first, of the Zoning Laws and Ordinances Adopted During 1931; the second, of City Planning and Related Laws in 1931; the third, of City Planning Commissions in the United States.

DR. KAMPFFMEYER'S DEATH, AND THE INTERNATIONAL HOUSING TOUR

DR. HANS KAMPFFMEYER, General Secretary of the International Housing Association, who was arranging the International Housing Tour to southwest Germany and Switzerland, died a short time ago. Just previously the date of the tour had been changed from July 2-16 to July 13-27 to permit those attending the International Conference for Social Work to join it. F. M. Wibaut, President of the Association, will have general supervision of the tour, and Bernard Kampffmeyer, President of the German Garden City Association, the immediate direction.

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MOTOR GRADERS, PLOWS & SCRAPERS, BITUMINOUS DISTRIBUTORS DRAGS, SHOVELS & CRANES, DUMP WAGONS, SNOW PLOWS.

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Accidents

City held not liable to lineman injured through breaking of rotted light pole (Arkansas Supreme Court: *City of Little Rock v. Holland*, 42 S. W. 2d, 383).

City held not liable for injury to employee unauthorizedly riding on city truck (Oregon Supreme Court: *Rice v. City of Portland*, 7 Pac. 2d, 989).

Bribery

Offer of money to Councilman to influence action on license application constituted crime of attempted bribery (Georgia Court of Appeals: *Taylor v. State*, 160 S. E. 667).

Unconstitutionality of license tax ordinance held no defense to charge of accepting bribery not to enforce same (Georgia Supreme Court: *Taylor v. State*, 162 S. E. 504).

Business Regulations

Regulations requiring laundries to file bond, schedule of prices, statement of address, etc., held valid, but levy of discriminatory tax against non-residents held void (Georgia Supreme Court: *City of Newnan v. Atlanta Laundries, Inc.*, 162 S. E. 497).

Requirement for registration of beauty culturists upheld (Florida Supreme Court: *State v. Reeve*, 139 So. 817).

Charters

City's adoption of charter implies adoption of judicial interpretation previously given to similar charter (California District Court of Appeals: *Mann v. Brison*, 7 Pac. 2d 1110).

Civil Service

Veterans' Preference Act upheld, but interpreted as not giving preference in the laying-off of employees (Michigan Supreme Court: *Swantush v. City of Detroit*, 241 N. W. 265).

Employee discharged for more than three days' absence without notice held not entitled to reinstatement (New York Supreme Court, Niagara County: *O'Malley v. Robbins*, 255 N. Y. S. 161).

Contracts

City's part payment under invalid contract held not admission of greater liability (Kentucky Court of Appeals: *Gugenheim v. City of Marion*, 46 S. W. 2d, 478).

Damage Claims

Statutory notice of damage claim held not invalidated by patent typographical error (Kansas City, Mo., Court of Appeals: *Merritt v. Kansas City*, 46 S. W. 2d, 275).

Requirement for filing notice of damage claim against city held not enforceable against immature minor, and statute limiting time for suit held not operative during minority (New York Court of Appeals: *Russo v. City of New York*, 179 N. E. 762).

Explosives

Prohibition against discharging firecrackers "or other explosives" held inapplicable to explosives used in construction work (New Hampshire Supreme Court: *Hannon v. Kerr*, 159 Atl. 121).

Finances

Temporary transfer of idle funds to fund having sufficient income to repay held not illegal diversion (Illinois Supreme Court: *Gates v. Sweitzer*, 179 N. E. 837).

City's creditors held entitled to payment in order of presentation of demands (Florida Supreme Court: *State v. Livingston*, 139 So. 360).

Provision that no city "department" should incur city liability without approval of board of finance held applicable to mayor (Massachusetts Supreme Court: *Broadhurst v. City of Fall River*, 179 N. E. 586).

Notes for fire apparatus held invalid for lack of statutory approval by State Board of Tax Commissioners (Indiana Appellate Court: *Citizens' Bank of Anderson v. Town of Burnettsville*, 179 N. E. 724).

Legislative Control

Corporate limits and charters held subject to alteration by statute (North Carolina Supreme Court: *Town of Highlands v. City of Hickory*, 162 S. E. 471; *Hasty v. Town of Southern Pines*, 162 S. E. 480).

Licenses

Itinerant doctor held subject to license tax although medicine was shipped from another state (Kansas Supreme Court: *Slocum v. City of Fredonia*, 8 Pac. 2d, 332).

Municipal Bonds

Violation of statutory provisions in issuing bonds held cured by validating act (United States Circuit Court of Appeals, Fourth Circuit: *Starmount Co. v. Ohio Savings Bank & Trust Co.*, 55 Fed. 2d, 649).

Bond recital of compliance with statutes and constitution held conclusive against municipality in favor of innocent holders (United States Circuit Court of Appeals, Fourth Circuit: *Starmount Co. v. Ohio Savings Bank & Trust Co.*, 55 Fed. 2d, 649).

Judgment on interest coupons held payable out of taxes levied to pay interest (Florida Supreme Court: *State v. Livingston*, 139 So. 364).

Bond coupons held governed by provisions in bond (United States Circuit Court, Middle District of Alabama: *Brown-Crummer Investment Co. v. City of Florala*, 55 Fed. 2d, 238).

Attempt to amend council records to show no quorum present held violative of bondholders' rights (United States District Court, Middle District of Alabama: *Brown-Crummer Investment Co. v. City of Florala*, 55 Fed. 2d, 238).

Officers

Dismissal of Assistant Corporation Counsel for neglect of duty and because his wife shared compensation of his subordinates held not subject to judicial review (Connecticut Supreme Court of Errors: *Bolton v. Tully*, 158 Atl. 805).

Acceptance of appointment for one year and retirement without protest held to bar Chief of Police from asserting statutory right to additional year (Arkansas Supreme Court: *City of West Helena v. Patrick*, 46 S. W. 2d, 36).

Ordinances

Protests against ordinance held invalid because not verified by a signer (California District Court of Appeals: *Mann v. Brison*, 7 Pac. 2d. 1110).

Public Utilities

Citizens held not entitled to enjoin increase in city water rates (Georgia Supreme Court: *Alford v. City of Eatonton*, 162 S. E. 495).

Sewer Assessments

Farm subject to sewer assessment as "urban" property, where surrounded on three sides by urban developments (Pennsylvania Superior Court: *City of Philadelphia v. Brady*, 157 Atl. 694).

Street Grading

Abutter not entitled to damages for change of street grade on failing to show difference between value of property immediately before and after change (Texas Court of Civil Appeals: *City of Dublin v. Prim*, 43 S. W. 2d, 317).

Street Improvements

Requirement for bond from contractor in "improvement of land" inapplicable to construction or repair of streets (Pennsylvania Superior Court: *Borough of Somerset v. Barber*, 157 Atl. 501).

Street Repairs

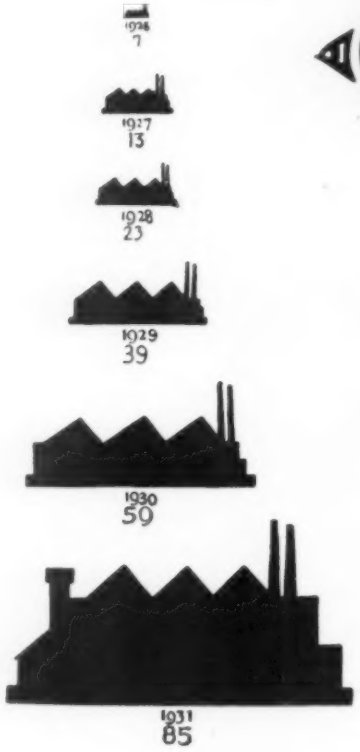
City's acceptance of boulevard established by development company held to involve duty to keep in reasonable repair (Pennsylvania Supreme Court: *Appeal of City of Erie*, 157 Atl. 476).

Tax Exemptions

Constitutional exemption of municipal property from taxation did not exempt from state gasoline tax (Idaho Supreme Court: *Independent School District v. Pfost*, 4 Pac. 2d. 893).

University fraternity chapter house not tax exempt as charitable institution (Louisiana Court of Appeal: *Beta Xi Chapter of Beta Theta Pi v. City of New Orleans*, 137 So. 204).

Growth of Factories



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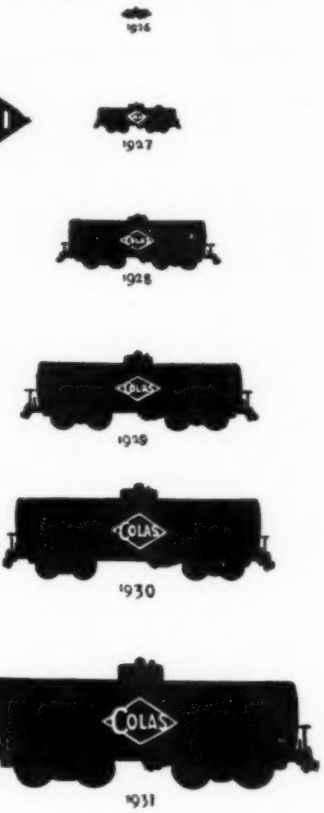

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

Regional Plan

The Regional Plan of the Philadelphia Tri-State District.—Regional Planning Federation of the Philadelphia Tri-State District, Philadelphia, Pa. 1932. 589 *quarto pp., plus maps.* $10.00 ($7.50 *to members of professions interested in planning work.*) *(Apply to the Federation,* 1420 *Walnut St., Philadelphia, Pa.)*

The Philadelphia Tri-State District includes five counties in Pennsylvania, five in New Jersey, and one in Delaware, including the cities of Philadelphia, Wilmington, Trenton and Camden. The comprehensive plan, in process since 1928, when a fund of $600,000 was raised to cover the cost of preparation, is the joint product of 200 technicians. It has been designed to provide for double the present population of more than 3,520,000, an increase expected during the next 50 years. The large volume which contains the Plan is delightfully illustrated with many photographs and a number of old prints of historic places in the region. It is in two parts and is well summarized. Section One, the Plan itself, takes up probable distribution of population, highway and transportation facilities, parks and parkways, water supply and sanitation, and architectural and esthetic considerations. Section Two includes supporting technical data and other planning information. There is a classified table of contents, but no index.

Housing

The annual Report of the New York State Board of Housing, Legislative Document (1932) No. 84, is concerned with housing activities under the State Housing Law, which apparently took place only in New York City during the period covered by the report. There are chapters on The Building Industry and Low Cost Housing; Housing Under the Law; Tax Exemption and the State Housing Law; Survey of the Lower East Side; Projects Under the Law; Construction and Maintenance Costs of Housing Board Projects. 80 pp., including many tables. (Apply to the Board, 80 Centre St., New York.)

Fireworks

A reprint from the May issue of *Minnesota Municipalities* entitled "Fireworks—Regulating Their Sale and Discharge" includes an article by Ambrose Fuller, Attorney, League of Minnesota Municipalities, and two ordinances. 3 pp. 10c. (Apply to the League, 16 University Library, Minneapolis, Minn.)

Safety in Swimming

The 'Swimmers' Safety Pledge," prepared by Mrs. Marie Wait Bishop, teacher of swimming, gives fifteen rules which have been proved valuable in "playing safe in the water," and are of special interest at this season of recreation at lake and seashore. The author has copies available upon application, and also copies of the 6-page illustrated folder program of the June Gambol at Ye Olde "Four" Swimmin' Hole, a public event conducted by Mrs. Bishop at Public School 4, The Bronx, New York, which included a play, songs, and contest events expressing the safety principles which are emphasized in her work. (Address: 1439 University Avenue, New York.)

Traffic

In order to assist local officials in the use of the Model Municipal Traffic Ordinance prepared by the National Conference on Street and Highway Safety, Dwight McCracken, former Erskine Fellow at the Albert Russel Erskine Bureau for Street Traffic Research, Harvard University, has prepared "Traffic Regulation in Small Cities" for the Municipal Administration Service (Publication No. 26). The author has "brought together and adapted and applied to the traffic problems of the average small city the practical principles of sound traffic engineering which are prerequisite to the successful and economical administration of this difficult but necessary function." 25 pp. 25c. (Apply to Municipal Administration Service, 309 E. 34th St., New York.)

Water Supply

At the suggestion of the Chief Engineer of the Virginia State Board of Health, the Department of Civil Engineering of the Virginia Polytechnic Institute made a study of the reservoir at Pulaski, Va., in order that those in charge of the public water supply in other small communities throughout the state might have a guide in the study, control and operation of their reservoirs. Most of these small communities cannot afford the cost of treating their water to eliminate the objectionable features which occur in the summer and early fall, and want to know how to operate their reservoirs so that a minimum of objectionable water is taken into the distribution system. "A Study of the Pulaski Reservoir," by F. J. Sette, Associate Professor of Sanitary Engineering, is published by the Virginia Polytechnic Institute as a bulletin in the Engineering Experiment Station Series. 67 pp. (Apply to the Engineering Experiment Station at the Institute, Blacksburg, Va.)

Sewage

"Development of Power from Sewage Sludge Gas," by W. B. Walraven, Member I.S.E., of the Springfield, Ill., Sanitary District, has been reprinted from the April *Bulletin of the Associated State Engineering Societies.* Mr. Walraven, who believes in the possibility of using sewage gas for heating purposes, discusses the factors involved in the problem, which he investigated with a view to the possibility of utilizing gas from the sewage treatment plant of the Springfield Sanitary District. 11 pp. (Apply to Mr. Walraven, Springfield Sanitary District, Springfield, Ill.)

Fiscal Problems

A 48-page booklet on "The Fiscal Problems of Municipalities of New York State, with Comparative Statistics for Second and Third Class Cities" has been prepared by the firm of Meech, Harmon, Lytle and Blackmore, municipal accountants. The cities studied have been arranged in groups which, roughly speaking, have uniform general conditions. Tabulations are presented showing unit costs of government, per capita net bonded debt, maximum and minimum group costs of services. A limited number of copies is available, without charge, to municipal officials. (Apply to Meech, Harmon, Lytle and Blackmore, M & T Bldg., Buffalo, N. Y.)

Capital Budgets

A manual of procedure and practice on the budgeting of capital expenditures of cities over a term of years is presented in pamphlet form by the New York State Conference of Mayors. It is entitled, "The Preparation and Administration of a Municipal Capital Budget," and is by Albert H. Hall, Director of the Bureau of Training and Research, of the Conference. It is a valuable and timely study. 74 pp. A limited number of copies are available from the Conference, City Hall, Albany, N. Y.

Hospitals

Under the title, "A Survey of the Organization and Operation of the Tax-Supported Hospitals in the County of Hamilton and City of Cincinnati," the Cincinnati Bureau of Municipal Research has submitted to the City Manager of Cincinnati and the Board of County Commissioners of Hamilton County a 183-page mimeographed report which includes separate sections on each institution and takes into account their mutual relationships. Report No. 39, January, 1932. (Apply to the Bureau, 914 Main St., Cincinnati, Ohio.)

County Finances

Two valuable studies have recently been made by the Cincinnati Bureau of Municipal Research and transmitted to the Board of County Commissioners of Hamilton County, Ohio: "A Survey and Report on the Budget Procedure for the County of Hamilton" (Report No. 40, March, 1932, 74 pp.); and "A Survey and Report on the Purchasing Procedure of Hamilton County" (Report No. 38, December, 1931, 42 pp.). Mimeographed. (Apply to the Bureau, 914 Main St., Cincinnati, Ohio.)

Municipal Administration

Government by Cooperation.—By Emerson D. Fite. 345 *pp. The Macmillan Co., New York.* 1932. $3.00 *from* THE AMERICAN CITY.

Professor Fite gives a first bird's-eye view of a remarkable development, the extent of which is not generally appreciated; the growth of voluntary associations of public officials and technicians to promote efficient administration and to fill the gaps left by our dual system of government. He extends his field also to trade associations and international cooperative agencies. His treatment of each example is necessarily brief, and seems frequently to be based upon prospectus rather than accomplishment. He rather broadly calls "cooperation" even the movement for consolidation of governmental units. Even a quick reading of the book will be encouraging to the public official and layman interested in government, as picturing a more wholesome approach to the solution of administrative problems than the great American "There ought to be a law."

CHARLES S. ASCHER.

Municipal Bonds

Moody's Manual of Investments: Government Securities.—Moody's Investors Service, 65 Broadway, New York. 1932. 2,445 *pp.* $30, *including weekly supplements.*

Moody's governmental and municipal manual constitutes an authoritative compendium of information on American and foreign governmental and municipal securities. The section on American state and municipal bonds and financial information covers 1,281 pages. Particular effort is stated to have been made to give an accurate record of municipal issues, together with the latest figures on total debt, assessed valuation, tax rates, etc. Ratings are also given. An added feature in the American section is the optional dates on bonds.

Financial Statistics

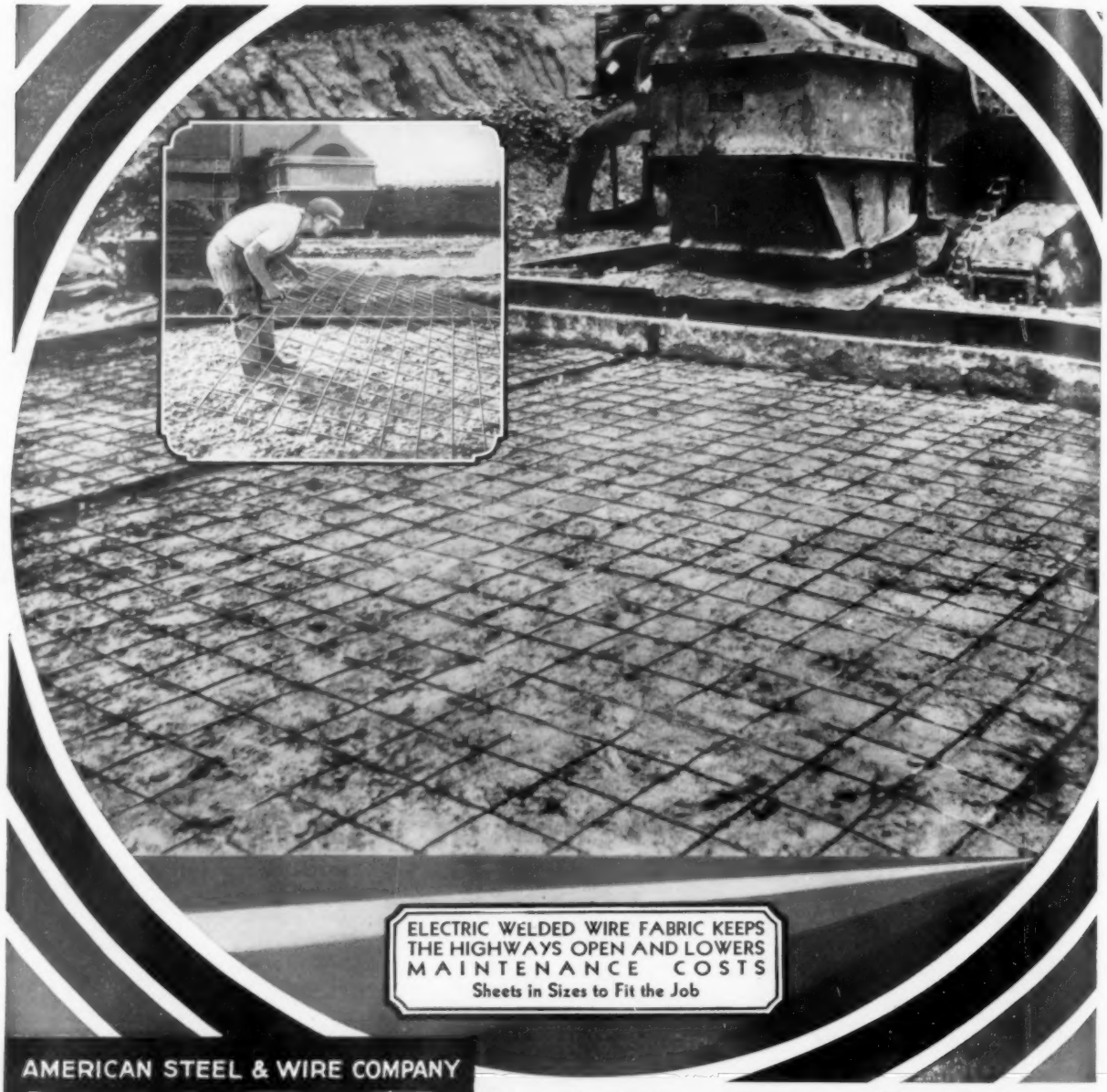
A 47-page summary of the "Financial Statistics of Cities Having a Population of Over 30,000: 1930" has been issued by the United States Bureau of the Census, giving total revenues, governmental-cost payments, indebtedness, assessed valuation of property, and levies of general property taxes, for the 310 cities of the United States in this population group. 10c. (Apply to Superintendent of Documents, Washington, D. C.)

Motor Equipment

A very thorough study of motor-vehicle equipment for city purposes in St. Louis has been made by the Bureau of Municipal Research of that city, and is reported under the title, "Survey of Motor Equipment, City of St. Louis." It includes a letter of transmittal to Comptroller Louis Nolte, dated April 25, 1932. Detailed studies of operation and maintenance were made for the 611 units owned by the city government proper and the 299 Police Department units; less intensive consideration was given to 30 units not covered by the city budget. A confused situation as to administration, control and cost is revealed; greater centralization and the development of adequate unit-cost records are particularly recommended. A brief summary is given in the April 30 number of the Bureau's bulletin. The report proper consists of 64 mimeographed pages. (Apply to the Bureau, 702 Fullerton Bldg., St. Louis, Mo.)

Unemployment Relief

"Educational Activities for the Unemployed" and "Railroad Subsistence Gardens" are the titles of two recent mimeographed reports of the President's Organization on Unemployment Relief. The former gives brief accounts from 56 communities of the educational opportunities made available to the unemployed, and the latter describes the efforts made by railroads throughout the country to encourage the planting of subsistence gardens by low-income employees and furloughed workers. 29 and 18 pp. (Apply to the Organization, 1734 New York Ave., Washington, D. C.)



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Government

Cost of Government in the United States, 1929-1930.—National Industrial Conference Board, Inc., New York. 1932. 167 *pp.* $3.00 *from* THE AMERICAN CITY.

All governmental divisions in the United States are covered in the Conference Board's studies of the cost of government. The ninth issue of the series, like its predecessors, shows "the amounts of expenditures by national, state, and local governments and, in broad classifications, the purposes for which the expenditures are incurred; also the receipts of each form of government and the types of taxation that contribute to the total." The public debt of the various governmental divisions and the activities of national and state governments in public road construction are also analyzed.

Economic Problems

Economic Science and the Common Welfare.—By Harry Gunnison Brown, Professor of Economics in the University of Missouri. Fifth edition. Lucas Brothers, Columbia, Mo. 1931. 472 *pp.* $3.00 *from* THE AMERICAN CITY.

The increasing attention which public officials and civic organizations are devoting—voluntarily or involuntarily—to economic problems gives special value to this revised and enlarged edition of Professor Brown's book. Problems of Price, Price Levels, and Trade are discussed in Part I, with chapter headings including Competition and the Price System, The Problem of Monopoly and Monopoly Price; Money and the General Price Level; Commercial Banking and the Level of Prices; Depression, Prosperity and the Price Level; Trade, Protective Tariffs and Prices; Rates, Valuation and Prices. Part II is devoted to Interest, Wages and Rent, with chapters on The Determination of Value; Ultimate Determinants of Value; The Causes of Interest, The Rate of Interest; Wages and Population; The Rent of Land and Its Taxation.

Professor Brown is an intelligent and convincing exponent of land-value taxation as the chief source of public revenue. He devotes 73 pages of the book to a chapter on The Rent of Land and Its Taxation, and concludes that "the change here discussed would remove heavy tax burdens some of which rest in large degree on wages; it would add to the net returns on capital; it would discourage speculative holding of land; it would make more easy the acquiring of land for production or for homes and so would facilitate the change from tenancy to ownership."

Recreation

"Charges and Fees for Community Recreation Facilities and Activities of Public Park, Recreational and School Systems," the report of a study made by the National Recreation Association, is particularly timely because of the present pressure for economy in municipal expenditure. Current practices of municipal departments, the principles guiding them, and present trends, are indicated in the study. It is based on information received from 175 departments—park, school and recreation—including those in ten Canadian cities. 158 pp. $1.00, paper; $1.50, cloth. (Apply to the Association, 315 Fourth Ave., New York.)

Nuisances

An article on "Public Nuisances," by Ambrose Fuller, Attorney, League of Minnesota Municipalities, and an ordinance classifying and prohibiting nuisances, have been reprinted from the March issue of *Minnesota Municipalities*, under the title of "Nuisances—Their Classification and Control." 7 pp. 10c. (Apply to the League, 16 University Library, Minneapolis, Minn.)

Sanitation

"Sanitary Inspection and Control of Private Property, Including an Ordinance" is the title of an article by Ambrose Fuller, Attorney, League of Minnesota Municipalities, which has been reprinted from the April issue of *Minnesota Municipalities*. 4 pp. 10c. (Apply to the League, 16 University Library, Minneapolis, Minn.)

Port

"The Port of Albany," an illustrated booklet published by the Albany Port District Commission in connection with the dedication of the port (June 6-7), describes the "destiny, birth, growth and promise" of Albany as a destination for ocean vessels. 48 pp. (Apply to the Commission, 74 Chapel St., Albany, N. Y.)

Standards

Standards Yearbook, 1932—Compiled by the Bureau of Standards; George K. Burgess, Director. Government Printing Office, Washington, D. C., 1932. 394 *pp.* $1.00 *from the Superintendent of Documents, Washington, D. C.*

The sixth issue of the Standards Yearbook presents a picture of the standardization movement in various fields of industry conducted by certain national and international agencies. It includes chapters on: Standardization in Communication—A Symposium; International Standardizing Agencies; National Governmental Standardizing Laboratories; National Industrial Standardizing Bodies; Federal Standardizing Agencies; National Bureau of Standards; Municipal, County, and State Purchasing Agencies; General Standardizing Agencies, U. S. A.; Standardizing Activities of Technical Societies and Trade Associations; and an index.

Housing

"Production Costs, Building Costs, and Total Costs at Sunnyside Gardens, L. I." is the title of a reprint of two articles by Rosalind Tough, formerly Instructor in Economics, Hunter College, New York City, which appeared in the *Journal of Land & Public Utility Economics* for February and May, 1932. This analysis of costs was permitted because the City Housing Corporation, which built Sunnyside Gardens, being a limited dividend company and semi-philanthropic in character, "desired that commercial and non-commercial undertakings in the field of housing benefit by its experience." 23 pp. Looseleaf reprints are available, 50c for the two articles. Apply to the *Journal*, 337 E. Chicago Ave., Chicago, Ill.)

Regional Planning

The Regional Plan Association, Inc., of New York, is publishing a series of booklets covering the various counties within the region covered by the Regional Plan of New York and Its Environs. "Essex County and the Regional Plan—Just What This Great Enterprise Means to the County and Particularly to the Community in Which You Live" is one of the first of these booklets. 24 pp., illustrated with maps. 20c. (Apply to the Association, 400 Madison Ave., New York.)

Legal Aid

The Children's Bureau of the U. S. Department of Labor has issued "'Legal Aid—Social Statistics in Child Welfare and Related Fields; Annual Report for the Registration Area for the Year 1930," by Glenn Steele. The growth of legal aid and the various types reported are described, and the importance of uniform reporting is commented on. 8 pp. 5c. (Apply to the Superintendent of Documents, Washington, D. C.)

Municipal Electricity

The Institute for Economic Research, in connection with its more extensive studies in municipal ownership, presents a detailed study of the situation with regard to municipal light and power plants in a state where activity in this field has been specially pronounced. It is entitled "Municipally Owned Electric Utilities in Nebraska," by Paul Jerome Raver and Marion R. Sumner. Chapter topics include history, reasons for changes in ownership, legal and statutory provisions, methods of financing, market area provisions, taxation exemption, sale or lease provisions, state regulation, and summary. The treatment is unbiased and largely statistical. 61 pp. $1.50. (Apply to the Institute, 337 E. Chicago Ave., Chicago, Ill.)

Housing

A double number of *Housing and Building*, three-language publication of the International Housing Association, is devoted to profusely illustrated accounts of "Housing in Switzerland and in Frankfort/M., Mannheim and Karlsruhe." Recent developments and the present state of housing in these towns are discussed by authorities. 102 pp. 8 marks. (Apply to the General Secretary, Frankfort/M., Hansa-Allee 27, Germany.)

Municipalities

Urbanistica is the title of a new Italian magazine, subtitled (in Italian) "Bulletin of the Piedmont Region of the National Institute of Municipalities." It deals with the progress of cities and towns in Italy. 25 lira a year for 6 copies. (Apply to F. Casanova & C., Via Po, N. 39, Torino, Italy.

Public Utilities

Principles of Public Utilities.—By Eliot Jones, Ph. D., Professor of Economics, Stanford University, and Truman C. Bigham, Ph. D., Professor of Economics, University of Florida. 1931. 799 *pp.* $6.00 *from* THE AMERICAN CITY.

The word "public" deserves emphasis in the title of this book, inasmuch as the principles discussed are those of utility systems—electric, gas, street railway, telephone and water—in relation to the public; and the public interest has been kept constantly in mind, without sacrificing impartial treatment. The scope is primarily economic, but also includes relevant topics in law, engineering, political science and accounting. Regulation, by municipal, state and Federal agencies, of various aspects of public utilities, and by various methods and theories, is gone into extensively; it is looked upon as having thus far been an inadequate public safeguard, but subject to substantial improvements that can increase its effectiveness. Public ownership is regarded without bias, as an effective alternative under appropriate conditions.

Government

Ourselves and the Community.—By E. E. Reynolds. Cambridge, England: At the University Press; New York: The Macmillan Co. 1932. 268 *pp.* $1.25 *from* THE AMERICAN CITY.

This small book is a simply written English outline of political and social organization, local, central and international. It is intended primarily "for the information of those who are within a few years of being included on the register of electors," but it should prove useful to many others who want a non-technical explanation of the complexities of the British governmental system. It considers the functions and services of local and national government in Great Britain, and describes briefly the organization of the Dominions and the League of Nations.

Loans

Small Loan Legislation—A History of the Regulation of the Business of Lending Small Sums.—By David J. Gallert, of the New York Bar; Walter S. Hilborn, of the New York Bar; and Geoffrey May, of the Inner Temple, London. Russell Sage Foundation, New York. 1932. 266 *pp.* $3.00 *from* THE AMERICAN CITY.

This is the third volume in the Small Loan Series published by the Russell Sage Foundation. It is divided into two main sections, Part I, Small Loan Laws, Part II, Wage-Assignment Laws. The basis of small loan legislation, early attempts and experiments, the uniform small loan law, existing legislation and its constitutionality are discussed, as well as the history of wage-assignment statutes. The fifth draft of a uniform small loan law is included in an appendix.

Chambers of Commerce

"Chamber of Commerce Fundamentals" is the title of an interim report brought in to the recent San Francisco convention of the Chamber of Commerce of the United States by the Special Chamber Committee on Local Chambers of Commerce; the Committee is investigating the functions and field of work of local chambers. The report, which was approved by a resolution of the convention, takes up the nature and purposes of chambers of commerce; leadership; programs of work; emergency activities; centralization; and financial support. 23 pp. Single copies on request; $5 per 100. (Apply to the Chamber of Commerce of the United States, Washington, D. C.)

Ballots

The Bureau for Government Research of West Virginia University, in a bulletin, "About Ballots," discusses different types used in the state and recommends an ordinance which would probably provide a suitable ballot form for small towns. The fact that the state constitution provides that voting shall be by ballot probably explains why the bulletin does not even mention voting machines. 11 pp. (Apply to the Bureau, West Virginia University, Morgantown, W. Va.)

City Planning

An illustrated article on "Ten Years of City Planning in Evansville," by Raymond W. Blanchard, Executive Secretary of the City Plan Commission, Evansville, Ind., has been reprinted from the April issue of *City Planning* by the Commission. 16 pp. (Apply to the City Plan Commission, Evansville, Ind.)

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Specifications

Miscellaneous Publication No. 130 of the U. S. Department of Commerce is a revised edition of the "National Directory of Commodity Specifications." The volume "represents an attempt on the part of the Department of Commerce to collect and publish a classified list and brief descriptions of the standards and specifications formulated by the national technical societies, the trade associations having national recognition, or other organizations which speak for industry or with the authority of the Federal Government as a whole." 548 pp. $1.75. (Apply to the Superintendent of Documents, Washington, D. C.)

Other Reports Received

ATLANTA, GA.—Annual Report, City Comptroller, 1931. 89 pp.

BOSTON, MASS.—Annual Report, Public Works Department, 1930. 209 pp.

BROOKLINE, MASS.—Annual Report, Water Board, 1931. 273 pp.

COOK COUNTY, ILL.—Comptroller's Report, Fiscal Year, 1930. 50 pp.

FORT WAYNE, IND.—Annual Report, Chamber of Commerce, June, 1932. 28 pp. Annual Report, Board of Park Commissioners, 1931. 33 pp.

HOLLAND, MICH.—Annual Report, Board of Public Works, 1931. 54 pp.

MCPHERSON, KANS.—Annual Report, 1931. 21 pp.

OGDEN CITY, UTAH.—Auditor's Annual Report, 1931. 28 pp.

SCHENECTADY, N. Y.—Annual Report, Bureau of Sewage Disposal, 1931. 14 pp.

STEVENS POINT, WIS.—Statistical Report, Water Department, 1931. 16 pp.

WESTCHESTER COUNTY, N. Y.—Report, Sanitary Sewer Commission, 1931. 58 pp.

WESTMOUNT, QUE.—Annual Reports, 1931. 61 pp.

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

JULY 4-6.—WINNIPEG, MAN. (100)
Union of Canadian Municipalities. Annual convention. Secretary, Samuel Baker, City Clerk, London, Ont.

JULY 6-9.—YELLOWSTONE PARK. (500)
American Society of Civil Engineers. Annual convention. Secretary, George T. Seabury, 33 West 39th Street, New York.

JULY 8-9.—CRAWFORDSVILLE, IND. (50)
Indiana Commercial Secretaries Organization. Annual meeting. Secretary, Glen B. Maple, Chamber of Commerce, LaPorte, Ind.

JULY 19.—LEXINGTON, KY. (30)
Kentucky Commercial Executives Association. Annual meeting. Secretary-Treasurer, H. B. Skinner, Newport, Ky.

JULY 19.—NEW YORK. (400)
Union of the Municipalities of the Province of Quebec. Annual convention. Secretary-Treasurer, T. D. Bouchard, 132 St. James Street, Montreal, Que.

JULY 23-29.—LOS ANGELES, CALIF.
First International Recreation Congress and annual meeting of the National Recreation Association. Administrative Secretary, Thomas E. Rivers, 315 Fourth Avenue, New York.

JULY 26-28.—READING, PA. (300)
Pennsylvania Chiefs of Police Association. Annual convention. Secretary, H. S. Carey, Altoona, Pa.

JULY 30—AUGUST 6.—LOS ANGELES, CALIF.
American Association of Port Authorities. Annual convention. Secretary, Tiley S. McChesney, Whitney Bank Building, New Orleans, La.

JULY 31—AUGUST 13.—EVANSTON, ILL.
National Institute for Commercial and Trade Organization Executives. Annual session. Secretary, John N. Van der Vries, 607 First National Bank Building, Chicago, Ill.

AUGUST 16-18.—SPENCER, IOWA.
League of Iowa Municipalities. Annual meeting. Secretary-Treasurer, Frank G. Pierce, Marshalltown, Iowa.

AUGUST 16-18.—POTTSVILLE, PA. (250)
League of Cities of the Third Class in Pennsylvania. Convention. Secretary, Byron C. Houck, City Clerk, Williamsport, Pa.

AUGUST 21-24.—NEW YORK. (400)
Association of American Cemetery Superintendents. Annual convention. Secretary, William B. Jones, Superintendent of Highwood Cemetery, Pittsburgh, Pa.

AUGUST 23-25.—UTICA, N. Y. (200)
New York State Association of Chiefs of Police. Annual convention. Secretary-Treasurer, James L. Hyatt, 503 Western Avenue, Albany, N. Y.

AUGUST 23-25.—KENTVILLE, N. S. (200)
Union of Nova Scotia Municipalities. Annual convention. Secretary, Hon. Arthur Roberts, Bridgewater, N. S.

AUGUST 26-27.—ROCHESTER, N. Y. (200)
National Shade Tree Conference. Annual convention. Secretary-Treasurer, Dr. Rush P. Marshall, Yale University, New Haven, Conn.

AUGUST 29-31.—TRAVERSE CITY, MICH.
Michigan Association of Chiefs of Police. Annual convention. Secretary-Treasurer, Donald S. Leonard, State Police, 404 Commerce Building, Detroit, Mich.

SEPTEMBER 1-3.—FRENCH LICK, IND. (1,200)
United States Building and Loan League. Annual convention. Secretary, H. F. Cellarius, 12 East 12th Street, Cincinnati, Ohio.

SEPTEMBER 13-16.—ST. LOUIS, MO.
International Association of Municipal Electricians. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

SEPTEMBER 14-16.—NEW YORK.
National Identification Association. Annual convention. Secretary-Treasurer, E. W. Livingston, Jamesville, N. Y.

SEPTEMBER 18, WEEK OF.—WASHINGTON, D. C.
Annual meetings. American Civic Association, Inc. Executive Secretary, Harlean James, Union Trust Building, Washington, D. C. *American Institute of Park Executives and the American Park Society.* Executive Secretary, William H. Walker, 224 Wakewa Avenue, South Bend, Ind. *American Association of Zoological Parks and Aquariums.* Secretary, Roger Conant, Toledo Zoological Park, Toledo, Ohio.
The National Conference on Government (listed below) will meet in conjunction with these organizations.

SEPTEMBER 18, WEEK OF.—WASHINGTON, D. C.
National Conference on Government, a combination of the annual meetings of the following organizations: *National Municipal League*, Secretary Russell Forbes, 309 East 34th Street, New York; *Proportional Representation League*, Executive Secretary, George H. Hallett, Jr., 311 South Juniper Street, Philadelphia, Pa.; *National Association of Civic Secretaries*, Secretary, H. Marie Dermitt, Hotel William Penn, Pittsburgh, Pa.; *American Legislators' Association*, Director, Hon. Henry W. Toll, 850 East 58th Street, Chicago, Ill.

SEPTEMBER 19-21.—GRAND RAPIDS, MICH. (250)
International Association of Electrical Inspectors—Western Section. Annual meeting. Secretary, William S. Boyd, 175 Jackson Boulevard, Chicago, Ill.

SEPTEMBER 22-23.—ERIE, PA.
American Water Works Association—Central States Section. Annual convention. Secretary, B. J. Lechner, Water Department, Erie, Pa.

SEPTEMBER 26-29.—SAN DIEGO, CALIF.
California Conference on City Planning. League of California Municipalities. Joint meeting. Secretary of the Conference, C. J. S. Williamson, Chamber of Commerce Building, Los Angeles, Calif. Acting Secretary of the League, Gordon Whitnall, 1095 Market Street, San Francisco, Calif.

SEPTEMBER 26, WEEK OF.—SWAMPSCOTT, MASS.
Illuminating Engineering Society. Annual convention. General Secretary, E. H. Hobbie, 29 West 39th Street, New York.

SEPTEMBER 27-30.—SPRINGFIELD, MASS.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 29-OCTOBER 1.—PITTSBURGH, PA. (150)
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

OCTOBER 3-7.—WASHINGTON, D. C. (5,000)
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 10-13.—FORT WORTH, TEXAS. (300)
Southwest Water Works Association. Annual convention. Secretary-Treasurer, Lewis A. Quigley, Fort Worth, Texas.

OCTOBER 18-21.—SAN DIEGO, CALIF. (800)
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y.

OCTOBER 19-21.—DETROIT, MICH. (175)
International Association of Dairy and Milk Inspectors. Annual meeting. Secretary-Treasurer, Dr. Paul B. Brooks, State Department of Health, Albany, N. Y.

OCTOBER 20-21.—GADSDEN, ALA.. (100)
Alabama League of Municipalities. Annual convention. Secretary-Treasurer, M. L. Robertson, Cullman, Ala.

OCTOBER 22-24.—WASHINGTON, D. C. (30)
Conference of State Sanitary Engineers. Annual meeting. Secretary-Treasurer, R. E. Tarbett, U. S. Public Health Service, Washington, D. C.

OCTOBER 23-26.—MEMPHIS, TENN.
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, J. H. Hott, Association of Commerce, Fort Worth, Texas.

OCTOBER 24-27.—WASHINGTON, D. C.
American Public Health Association. Annual meeting. Acting Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

OCTOBER 24-26.—CINCINNATI, OHIO.
International City Managers' Association. Governmental Research Association. Joint conference. Executive Director of I. C. M. A., Clarence E. Ridley, 923 East 60th Street, Chicago, Ill. Secretary-Treasurer of G. R. A., D. H. Smith, Institute for Government Research, 722 Jackson Place, Washington, D. C.

OCTOBER 26-29.—ST. PAUL, MINN.
American Country Life Association. Annual conference. Executive Secretary, Benson Y. Landis, 105 East 22d Street, New York.

OCTOBER 31-NOVEMBER 2.—WINSTON SALEM, N. C.
American Water Works Association—North Carolina Section. Annual meeting. Secretary, Professor H. G. Baity, Department of Sanitary and Municipal Engineering, University of North Carolina, Chapel Hill, N. C.

NOVEMBER 14-18.—WASHINGTON, D. C. (400)
American Association of State Highway Officials. Annual convention. Executive Secretary, W. C. Markham, 1222 National Press Building, Washington, D. C.

NOVEMBER 14-18.—NEW ORLEANS, LA. (200)
American Society of Municipal Engineers. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

NOVEMBER 15-17.—RICHMOND, VA. (150)
National Association of State Auditors, Comptrollers and Treasurers. Annual convention. Secretary, Thomas H. Judd, Deputy State Treasurer, Hartford, Conn.

NOVEMBER 28, WEEK OF.—OR DECEMBER 5, WEEK OF.—NEW ORLEANS, LA.
The Asphalt Institute. Annual Asphalt Paving Conference. Managing Director, J. E. Pennybacker, 801 Second Avenue, New York.
Association of Asphalt Paving Technologists. Meeting in conjunction with the Annual Asphalt Paving Conference. Secretary-Treasurer, C. A. Mullen, 980 Saint Antoine Street, Montreal, Que.

Minnesota Is Rapidly Accomplishing a Complete and Skillfully Constructed Highway System

IN constructing over 5,000 miles of bituminous treated roads, the highway department of Minnesota has developed and proved methods of construction that are low in first cost and low in maintenance. These roads are durable and easy riding. They will handle heavy traffic and withstand the severe Minnesota winter weather.

Hundreds of miles of Minnesota roads are constructed with Standard Asphalt Road Oil. Roads and pavements built with Standard Asphalt Road Oil meet the requirements for durable low cost roads. When properly constructed and processed, either road-mixed or pre-mixed, they give full value.

If you are interested in low cost improved roads ask about Standard Asphalt Road Oil or Stanolind Cut-Back Asphalt.

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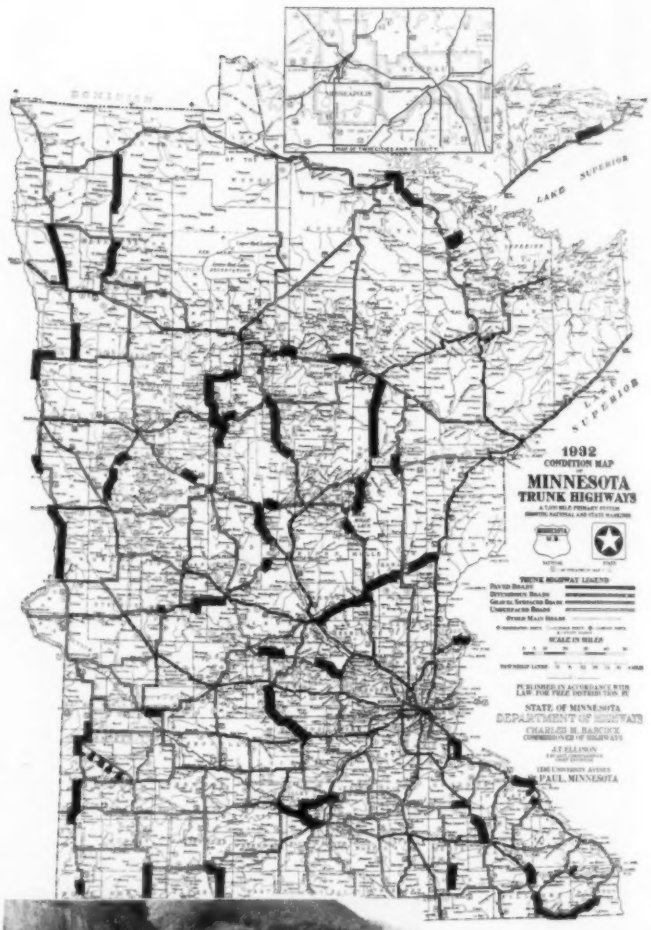


Minnesota Highway No. 3

Minnesota Highway No. 9

ASPHALTS FOR EVERY PURPOSE

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

LITTLEFORD SURFACE HEATER

Restoring Non-Skid Surfaces by Heating

When the surface of a bituminous macadam street or road develops a polish that presents danger of skidding, the proper remedy, rather than to depend on warning signs, is to restore it to a non-skid condition. A practical and economical method of doing this is by the use of the Littleford surface heater, made by Littleford Bros., 500 East Pearl Street, Cincinnati, Ohio.

This heater burns off the surplus tar or asphalt, after which the heated section can be raked, such treatment bringing back the granular texture of the road and eliminating the skidding menace.

Likewise when bituminous macadam becomes bumpy, the bumps can be softened by use of the surface heater, the inequalities then being taken out by raking.

The Littleford surface heater is also employed for the purpose of heating sheet asphalt surfaces when renewal is desired. After softening by the application of heat the old surface can be raked off to a depth of one or two inches, and new material can be applied.

Another application of the outfit is in burning weeds in drainage ditches and along the shoulders of highways. The intense heat from the burners is concentrated under the hood and quickly destroys the weeds.

The illustration herewith shows the heater in operation on a bituminous macadam surface, with a man raking over the section just heated.

About three minutes heating over a spot sufficiently softens the bituminous surface to remove the "fat" and restore the non-skid surface, speedily and at low cost.

New Type of Cable for Fire and Police Signal Systems

A cable of unusually small diameter and light weight, for use in fire-alarm and police signal systems, has been brought out by the Simplex Wire & Cable Co., 79 Sidney Street, Cambridge, Mass. It is made possible by the use of Latox, a new type of rubber insulation made from rubber latex. Each copper conductor is insulated with a thin layer of Latox, which has high dielectric strength and does not absorb water. It is stated to be practically pure vulcanized rubber, and to retain through exceptionally long life the pre-eminent qualities of rubber as cable insulation. Water-tight potheads and terminal boxes, required for paper-insulated cables, are not needed for Latox cable.

Latox fire-alarm cable is offered with either No. 16 or No. 18 A.W.G. solid conductors. Every completed length of cable is subjected to one-minute voltage tests between each conductor and all others, grounded to the lead sheath, 1,000 volts a.c. being employed for No. 18 wire and 1,500 volts for No. 16. Ten-foot samples tested in the laboratory in water are reported to have shown an average breakdown voltage of 12,000, equivalent to an average dielectric strength of 1,000 volts per mil thickness.

Improvements in Water-Meter Setting

Several new items making for added convenience in setting and reading water meters have been brought out by The Ford Meter Box Co., Wabash, Ind., as shown in their latest catalog.

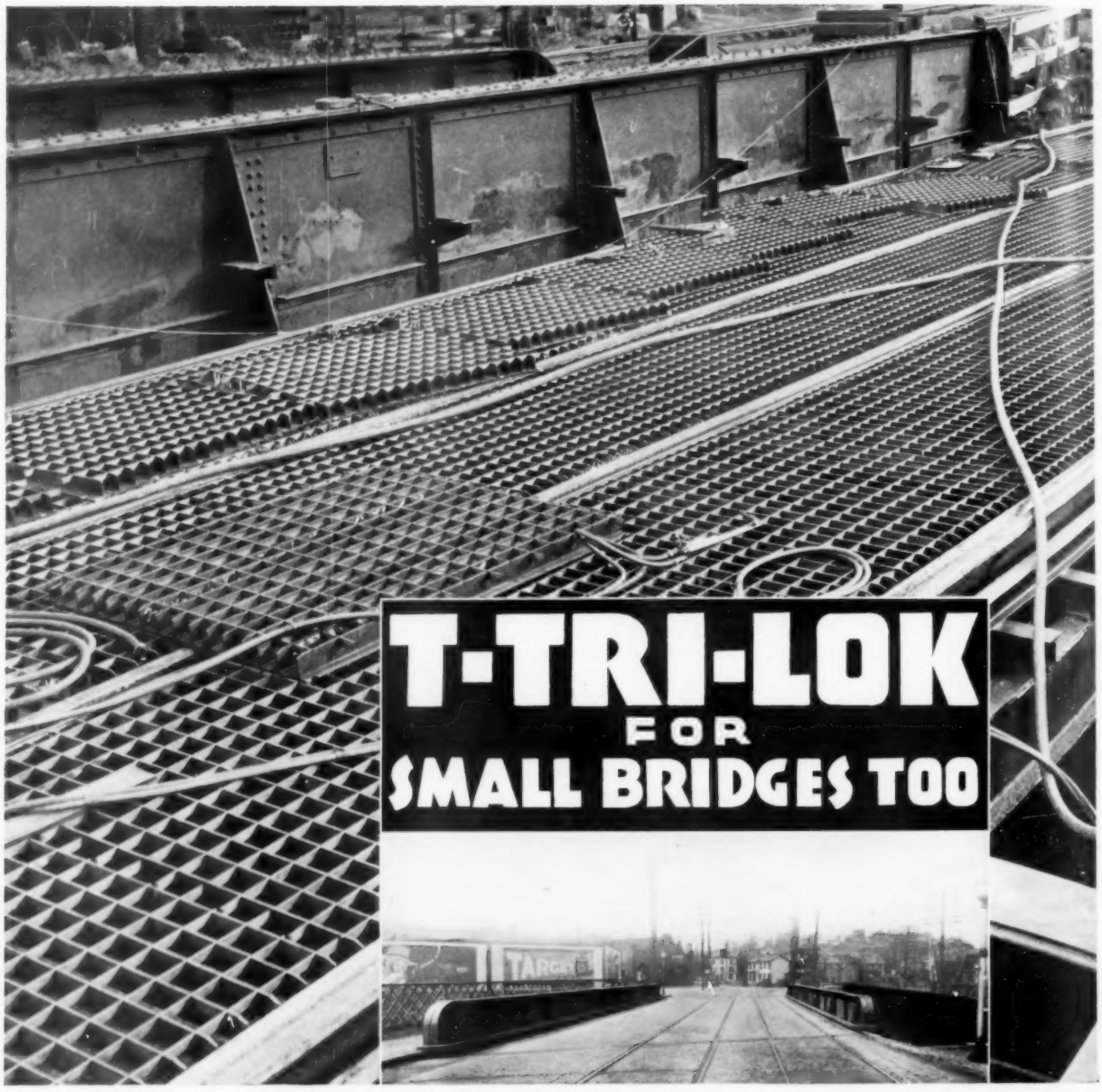
The improved 300 series Ford yoke for settings between risers has integrally cast inlet and outlet, the two ends being separable by means of an oblique joint in the middle of the yoke, provided with alignment pins and held tight by a large cadmium-plated bolt. This yoke takes the place of a pair of bent meter couplings and a pair of pipe couplings, at little if any additional cost. The meter can be set or removed easily by expanding or contracting the expansion connection by means of the handwheel.

The Ford Copperhorn meter coupling, having two arms of heavy seamless copper tubing connecting the meter to a cadmium-plated body piece, provides a convenient method of installing a meter on a basement riser pipe. The body piece takes the place of a few inches of the riser, and holds the ends permanently. The meter is set horizontally between the arms. (See further description at page 131 in February.) This coupling is also used for shallow outside settings in warm climates. Over 100 water works have already adopted it.

The Ford Type X meter-box cover can be leaned back as though hinged, facilitating the work of the meter reader. The lid is unlocked by turning the Ford worm lock, breaking any seal of ice or dirt; then by sliding it forward about a half-inch and turning it back it will stand approximately upright. There are no close-fitting pivots, nor openings in the lid. When the latter is replaced, no snow or dirt is carried into the box.

IMPROVING PENNSYLVANIA'S HIGHWAY SYSTEM

Model 15 Cletrac providing the power for a Galion one-man patrol, grading a Pennsylvania highway. The Cleveland Tractor Co. recently received an order from the State Highway Department for 50 of these crawlers, supplementing 67 purchased last year, in addition to 90 Model 80 Cletracs for heavier road construction and snow removal



Small bridges become vitally important when their reconstruction or resurfacing necessitates detouring of main highway traffic. In such cases, T-TRI-LOK helps speed up the job. One case is reported where a T-TRI-LOK resurfacing job was completed and opened for traffic in 48 hours!

T-TRI-LOK is furnished in standard units in widths up to 4 feet and in lengths up to 40 feet. After the units are secured to bridge stringers, the cells are filled flush with concrete, forming an armored concrete, anti-skid wearing surface of long life and high efficiency. If you are interested in rapid bridge floor construction, send for our T-TRI-LOK booklet.

CARNEGIE STEEL COMPANY

Subsidiary of United States Steel Corporation

PITTSBURGH, PA. 188

Program Features for Public Works Officials

Several important and timely topics and outstanding speakers have just been announced for the annual conference of the International Association of Public Works Officials, to be held September 29-30 and October 1 at the Hotel William Penn in Pittsburgh.

A prominent feature will be a discussion of "The Economic Readjustment and Its Relation to the Public Works Official," by C. A. Dykstra, City Manager of Cincinnati, and Robert P. Marsh, Superintendent of Streets and Engineering in Springfield, Mass.

Special emphasis will be laid upon the Uniform Street and Sanitation Record System sponsored by the Association and other municipal organizations (see page 39 of this issue). The elements of this system will be described and officials who have had experience with it will talk.

Other program features will be an address by Harrison P. Eddy, consulting engineer, Boston, on the selection of incinerator sites, and a discussion of sewer maintenance and catch-basin cleaning by Charles I. Palmer, Pittsburgh, Elwood Johnson, Washington, and John S. Flockhart, Newark.

The Association officers this year are: President, H. D. Bradley, Deputy Street Commissioner, Toronto; Vice Presidents, Carl Schneider, Mechanical Engineer, Division of Public Works, New Orleans; T. L. Costigan, Superintendent of Street Cleaning, Washington, and Mark B. Owen, Commissioner of Public Works, Dearborn, Mich.; and Treasurer, P. J. Hurtgen, Director of Public Works, Kenosha, Wis.

New Model Water Meter

Several special features are found in the Model GA water meter recently added to its extensive line by the Worthington Pump and Machinery Corporation, Harrison, N. J., which has commercially manufactured various types of water, oil, gasoline and grease meters for the past 75 years. This meter is of the positive displacement disc type, and is built in sizes from ⅝-inch to 2 inches, with normal flow limits from 1 to 160 gallons per minute, and is stated to be unusually accurate, particularly with very low flows.

WORTHINGTON MODEL GA WATER METER

All register gears are fitted with rubber-bushed bearings. The register box, of heavy construction, is fitted with a double lid to facilitate the cleaning of the cover glass. The train assembly comprises four cast bronze gears and four pinions, all rigidly fastened to Monel metal spindles which revolve in replaceable hard-rubber bushings. Although standard construction provides an inclosure for oil, the train may be easily converted to the open type by the substitution of an open train plate—removal of three screws releasing the train from the main case.

The disc or measuring chamber is in two sections, held together by a snap joint without screws. This construction permits the case to separate without distortion in the event of freezing. Additional protection is secured by the use of a cast-iron frost bottom on the three smaller meters. In case the water in the meter freezes, this breaks, preventing damage to the meter. The bottom is inexpensively replaced.

A particularly interesting feature of these new meters is the location of the stuffing box, which is cast on the main case instead of being a part of the train or register box. This eliminates a source of possible leakage, as no gaskets or lock nuts are necessary.

THE MT. VERNON, N. Y., WATER DEPARTMENT USES THIS 1½-TON INTERNATIONAL TRUCK WITH A SCHRAMM GAS-ENGINE-DRIVEN COMPRESSOR

The compressor operates a paving breaker and rock drill at the same time. It is also equipped for driving sheathing, clay digging, backfill, tamping, caulking, paint spraying and riveting. The truck is also equipped with special tool boxes and double hose reels which are placed as low as possible so that they will not brush against low-hanging limbs of trees.

Temporary Warning Flags for Traffic Line Work

All kinds of temporary markers are seen on highways where traffic strips are being painted. These markers are used to prevent traffic from crossing the newly painted line before it has a chance to dry. The National Highway Marker Co., Oaklyn, N. J., has developed a sturdy warning unit or marker which will stand the gaff. The base is made of extra-grade molded red rubber, cured soft for flexibility. It is made hollow to further increase resistance to damage. Accurate laboratory wind-tunnel tests have shown its ability to remain standing in velocities of wind over 60 miles per hour, and the heaviest truck can pass over the marker without damage to either the marker or the truck. The staff is red rubber especially designed and cured to obtain both strength and durability. Super Samson bunting is attached to the standard and is hemmed on all edges. This bright-red fast dye flag serves as an ample warning.

A series of small diameter rubber feet are molded around the bottom rim of the base, which allows air to circulate freely under the base to dry the traffic paint uniformly. The lock joint between the base and the staff insures a free, strong connection without the use of cement or metallic fastenings. Lugs molded integral with the staff are grooved vertically in the center to receive the binding of the flag. A solid brass fastener is passed through the lug and binding.

SOMETHING CAN BE DONE ABOUT THIS DUST!

WHY ask the public to tolerate blinding, germ-laden road dust when clean, odorless, non-tracking Calcium Chloride ends the dust nuisance quickly?

Give your roads the benefit of this modern dust preventive treatment. Do away with dust. Bind loose road materials together. Save wear. You can do it with Calcium Chloride. Hundreds of highway officials are already doing it.

In controlling dust, you are making maintenance work easier and less expensive—reducing dragging costs—making resurfacing necessary only half as often. Dust control with Calcium Chloride is an actual economy because it makes roads last longer. It pleases every driver and every home owner.

Get the complete Calcium Chloride story to-day. Address any of the firms listed below.

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Barberton, Ohio

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61 Broadway, New York City

THE CEDAR RAPIDS BITUMINOUS ROAD BUILDER AT WORK

A MASSEY-HARRIS FOUR-WHEEL-DRIVE TRACTOR EQUIPPED WITH A MAINTAINER

A Bituminous Road Builder

A complete plant which picks up windrowed aggregate from the road and mixes it with tar, asphalt, road oil, cutback asphalt or emulsion and discharges the material into a windrow in the rear of the machine has been developed by the Iowa Manufacturing Co., Cedar Rapids, Iowa. A wide ribbon feed pick-up blade of heat-treated alloy steel mounted on a flexible shaft permitting the blades to closely conform to the crown of the road moves the material from the windrow into the path of the bucket elevator line, which can carry as much as 135 tons of aggregate per hour up to the aggregate batcher.

The aggregate batcher installed above one end of the pug-mill mixing chamber has a counter for recording the number of batches released. The batcher is entirely automatic in operation and has ample capacity to take care of all materials picked up by the bucket elevator. The weight control is on the principle of the beam scale, assuring accuracy. A 1,000-gallon insulated storage tank for the bituminous material is mounted on the same chassis with the machine. It has two burners to maintain the correct temperature, and the tank can be easily filled while the plant is in operation. It is large enough to take the entire contents of the average distributor and is equipped with a thermometer for recording the temperature of the bitumen in the tank, and a gage for indicating the amount of bitumen on hand. The tanks are so insulated as to permit not more than a few degrees drop in bitumen temperature per hour.

The mixing chamber of the plant is of the continuous pug-mill type and is mounted in the center of the machine directly between the storage tank and the power-plant side. The mixer is 17 feet long, with a shaft on which are 39 sets of alloy steel paddles revolving at 72 r.p.m. The chamber is lined and self-cleaning and has a steel grating over the top, and can be raised or lowered from the rear end so that it will operate in a horizontal position on grades up to 3 per cent. The pug-mill can be jacketed and heated to take care of certain types of binders. The mixer discharges the completely mixed material into a windrow at the rear of the machine, where it is spread on the road either by hand, through a spreader box, with a blade or by a finishing machine, depending entirely upon the specifications and cost limits of the road. The plant can be operated 24 hours a day by installing a portable electric light plant on the machine.

This bituminous road builder is powered with a Model R41, 100-horsepower Climax engine equipped with a reduction gear, air cleaner, radiator, etc., complete. The engine has plenty of power to operate the machine in altitudes up to 5,000 feet and is built to both propel and operate the machine. A larger power unit will be furnished when the plant is to be operated in altitudes over 5,000 feet. A large storage tank for gasoline is mounted directly under the engine.

A Four-Wheel-Drive Tractor

A four-wheel-drive tractor, among the features of which are flexibility, balanced traction, short turning radius and narrow width, has recently been announced by the Massey-Harris Co., Racine, Wis. This tractor, when equipped with various attachments, may be used for maintenance work, hauling, stump pulling, brush cleaning, road building, dredging, filling-in, ditch cleaning, snow removal and similar jobs.

This GP tractor is powered by a 32-horsepower engine with a 4-inch bore and 4½-inch stroke, making 1,400 r.p.m. It has three forward speeds, 2¾, 4½ and 9 miles per hour, and a reverse speed of 3¼ miles per hour. Lubrication is by the forced-feed system by a gear pump and dip-pan splash, with an oil filtering device. A high-tension magneto with an impulse starter assures easy and quick starting under all weather conditions. The cooling system consists of a centrifugal type water pump, with an 18-inch fan mounted on Timken bearings and driven by a V belt. It has four-wheel drive, with 38-inch steel tires or solid cast wheels equipped with pneumatic or solid rubber tires.

The width of the tractor varies from 50 to 70 inches, depending on the wheel and tire equipment desired. The wheelbase is 52½ inches and the unit weighs from 4,000 to 7,000 pounds. Extra equipment includes lights, starter, bumpers front and rear, and a cab. Special attachments include a crane for mounting on the rear, a sweeper for either the front or the rear, a snow-plow, a maintainer, a bulldozer, a ditcher or a winch for mounting on the rear which will accommodate 700 feet of ½-inch cable and will exert a 5,000-pound straight line pull.

New A. S. & W. Warehouse

American Steel & Wire Co., Chicago, Ill., a subsidiary of the United States Steel Corp., has announced the opening of its new warehouse at 2364 South Ashland Ave., Chicago. The main office is at 208 South La Salle Street.

Synchronous Motors for Mount Clemens Pumping Station

The city of Mount Clemens, Mich., has recently installed four 1,800-r.p.m. synchronous motors, two of 200 hp. and two of 125 hp., for driving four high-head DeLaval centrifugal pumps. A Worthington diesel engine driving a 160-kva. electric generator has also been installed for stand-by service. The synchronous motors and generator were furnished by the Electric Machinery Mfg. Co., Minneapolis, Minn.

MT. CLEMENS PUMPING STATION, WITH SYNCHRONOUS MOTORS

. . . streets that are an ASSET . . . . . *not a liability*

St. Louis Avenue, East St. Louis, Illinois
Trinidad sheet asphalt laid over old brick in 1925. Still in excellent condition. No maintenance to date.

Dusty roads, streets filled with ruts and "pot holes" are a liability which hurts the prestige of a community and are likely to result in accidents to motorists.

This problem of repairing old roads is confronting many officials . . . perhaps you, who are responsible for the construction and maintenance of streets. If this condition exists in your section, you can solve this problem by converting the old, worn-out streets and roads into modern, long-life, dustless, smooth surface highways by placing an asphaltic top, bound together with Trinidad Lake Asphalt, right over the old, worn-out road.

You can use the present foundation of old concrete, brick, granite, wood-block or macadam and get a new road for the price of an asphaltic top. Think what a saving that means in these days of reduced paving appropriations.

Trinidad Lake Asphalt, created in the Trinidad Asphalt Lake, has been used by many cities throughout the world to resurface old, worn-out streets and roads.

THE BARBER ASPHALT COMPANY
New York Chicago St. Louis San Francisco

TRINIDAD
NATIVE LAKE
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KILL WEEDS

Ugly weeds in public walks and drives, athletic fields and tennis courts can be killed for the entire season with Dolge Weed Killer. Easy to apply—by sprinkling. Kills entire weed because it goes straight to the roots. Write for descriptive booklet containing guarantee, free testing privileges and prices.

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TWO NEW CATALOGS!

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WATER SPORTS DEVICES

Should you be interested in either Playground Equipment or Water Sport Devices you will appreciate seeing the new line of "American" products. Designate which catalog you wish and it will be sent immediately.

AMERICAN PLAYGROUND DEVICE CO.
ANDERSON, INDIANA

"EARLY SIGNS"
THE ORIGINAL AND MOST POPULAR

IN USE IN OVER 400 CITIES AND TOWNS

Porcelain enamel plates are guaranteed for 10 years against fading or chipping.
Certified malleable iron frames and staff. Adjustable to any angle. ***Agents Wanted***

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Asphalt Heaters
Surface Heaters
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DISTRIBUTORS IN PRINCIPAL CITIES
MOHAWK ASPHALT HEATER CO.
SCHENECTADY NEW YORK

THE HEIL SL HEAVY-DUTY DUMP UNIT FOR 1½-TON TRUCK

Hydraulic Dump Unit for 1½-Ton Trucks

The Heil SL heavy-duty hydraulic dump unit for mounting on 1½-ton chassis, which is durable, powerful and fast, is manufactured by The Heil Co., 3000 West Montana Street, Milwaukee, Wis. This unit consists of a self-contained cast-cylinder Heil hydraulic hoist mounted in a sturdy hoist supporting frame, a body to be selected from one of the Heil SL models, a power take-off and connecting parts and cab controls. The complete unit can be quickly and easily mounted on any 1½-ton short wheelbase truck designed for a 7-foot body.

Among the features of this unit are the alternate pump gear shaft providing for clockwise or counter-clockwise pump drive, the integral Heil hoist pump fastened directly to the hoist cylinders, the integral oil duct cored into the cylinder casting, the nickel-iron cylinder casting, the crosshead shaft firmly attaching the hoist piston rod to the bearing blocks, the tailgate control handle easily accessible from the cab, the offset type tailgate hinges, and the channel iron hoist frame which forms a sturdy support for the hoist and body assembly.

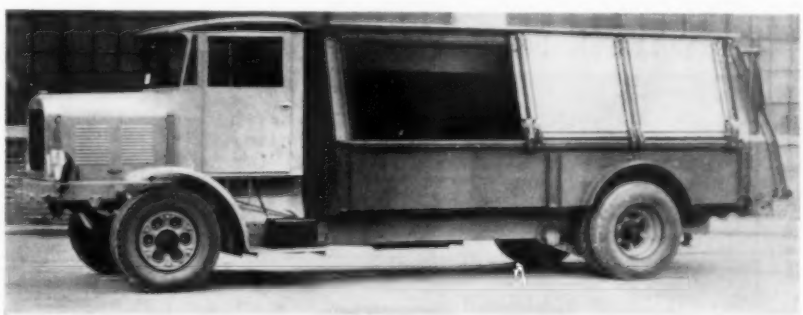
Low-Bed Front-Wheel-Drive Truck for Garbage Collection

A new 5-ton truck featured by low bed and front-wheel drive is now being made by the Four Wheel Drive Auto Co., Clintonville, Wis. This model, known as the LBU, is particularly adaptable to specialized hauling purposes where loading and unloading by hand is necessary, and where loads are either of fragile or of bulky character. For refuse collection, one class of work for which it is very suitable, bodies of 10- to 20-yard capacity and of many different types are carried.

The truck has a 91-hp. high-compression motor, from which power is transmitted to the front wheels by a 4-speed unit-mounted transmission and a 5-inch silent chain which drives the propeller shaft. The front wheels are driven by bevel-gear reduction acting through patented ball-and-socket joints, this method being grease-tight and dirt-excluding. The rear driving mechanism used in the regular FWD trucks is omitted.

With the front-wheel drive, the load is pulled rather than pushed, permitting higher average road speed with less sluing. The climbing action of the front wheels enables the truck to negotiate bad places that would otherwise be difficult. In refuse disposal, the truck can back out farther on the fill and pull out again after dumping the load. There are two sets of brakes, the service brakes acting on all four wheels, while the emergency brake acts directly on the propeller shaft.

The frame is made of two sections on different levels, joined by half-inch boiler-plate gussets designed for rigidity and strength. This type of frame construction, in conjunction with the patented rear-axle mounting, gives a straight, clear loading space from the back of the cab to the rear of the frame. Full spring action is provided by means of four semi-elliptic springs. The rear springs are mounted on outboard hangers and are attached to the drop center rear axle by means of a special forging. This rear-axle construction gives maximum ground clearance with full spring action. The company plans also to manufacture this type of truck in other capacities.



LOW-BED FRONT-WHEEL-DRIVE TRUCK

Water-Works Construction a Sound Relief Measure

With the purpose of impressing upon the public the fundamental value of construction of public works as a means of creating employment and stimulating consumption and business generally, it was decided at a recent meeting of cast iron pipe manufacturers, in Chicago, to conduct a thorough-going campaign of public education, including local work in all cities having a population over 3,000. In particular the fact is to be stressed that improvements in water-supply systems will not increase taxes, but are a self-sustaining means of furnishing relief for unemployment and trade.

New President for Austin

Austin Manufacturing Co., Chicago, Ill., has announced the election of S. F. Beatty as President of the company. Mr. Beatty is well known as the President of the Austin-Western Road Machinery Co. and of the Road Machinery Manufacturers Association, as well as for his many years of service as an officer and director of the American Road Builders' Association. W. T. Beatty, for many years President and General Manager of the Austin Manufacturing Co., has been elected Chairman of the Board, and K. N. Forbes, Vice-President.

Death of R. D. Mahaffey

R. D. Mahaffey, Vice-President and Treasurer of The American Well Works, Inc., Aurora, Ill., died on June 3, after an illness of several months, at the age of 65 years. He was identified with The American Well Works and the pump industry for 43 years, having started with the company as office boy and by hard work and energy attained the position of Treasurer and later that of Vice-President, holding the two offices for 30 years. Under the direction of Mr. Mahaffey and his associates his company assumed a position in the forefront of the industry, selling machinery throughout the world. He was past President of the Hydraulic Society, Vice-President of the Home Building & Loan Association of Aurora, Director of the Chamber of Commerce, and a charter member of the Union League Club, as well as other civic and social associations.

He is survived by a wife and a daughter, and his loss is also felt by a host of friends and associates.

Neptune Los Angeles Representative Dies

The Neptune Meter Co., 50 East 42nd Street, New York, has experienced the loss of Allen H. Nye, sales representative, who since 1911 had spent practically all of his time traveling throughout the southwestern states. His death takes away a valuable and faithful associate of the company.

Freeman P. T. L. Consultant

P. J. Freeman, who for many years was the Chief Engineer of the Bureau of Test and Specifications of Allegheny County, Pa., has returned to Pittsburgh Testing Laboratory, Stevenson and Locust Streets, Pittsburgh, as consulting engineer, and will specialize on problems relating to municipal construction, roads and pavements, technological control of concrete production and placement, etc.

Successful Resuscitations

With H-H INHALATORS!

Inhalation of petroleum vapors, gas, smoke, carbon monoxide and other poisonous fumes causes oxygen deficiencies in the lungs. The chances of successful resuscitation are greatly enhanced when the H-H INHALATOR is used as an adjunct to the prone pressure method of artificial respiration. Acquaint yourself with this well-known and successfully used safety appliance today.

WRITE FOR COPIES OF BULLETIN NO. 80

Mine Safety Appliances Co.

Braddock, Thomas and Meade Sts., Pittsburgh, Pa.

"EVERYTHING FOR MINE AND INDUSTRIAL SAFETY"

For Sale: A Bargain for Some City, County or Contractor

This complete asphalt paving plant, used only 6 weeks, for sale at 2/3 original price. Capacity 250 tons per day. First class condition. New machine guarantee. Fully portable. Oil Burners. Term payments if desired. Complete description on request.

Other products—Oil Burning Surface Heaters, Fire Wagons, Tar Kettles, Concrete Mixer Heaters, Kerosene Torches. Write for illustrated catalogs.

Chausse Oil Burner Company

Elkhart Indiana

ROOT TRUCK SPEED MAINTENANCE

A model for any size truck. Now furnished with Hydraulic or Pneumatic (air pressure) operation. Now is the time to cut the cost of street maintenance with a machine that will leave all street surfaces in smoothest condition.

Send for additional information

(Patented 5/10/1932)

ROOT SPRING SCRAPER COMPANY

Kalamazoo, Michigan

—WHERE AM I, MISTER?—

How often is that question asked in YOUR city, not only by strangers in town, but by your own citizens living in other sections? And all because your streets are not properly marked!

Our latest development in street signs will allow you to erect them on every corner.

Write for particulars

A four-way porcelain enamel sign, in aluminum holder, ready to mount on 2-in. post, complete, in reasonable quantities 6.50

—ROCHESTER STREET SIGNAL CO.—

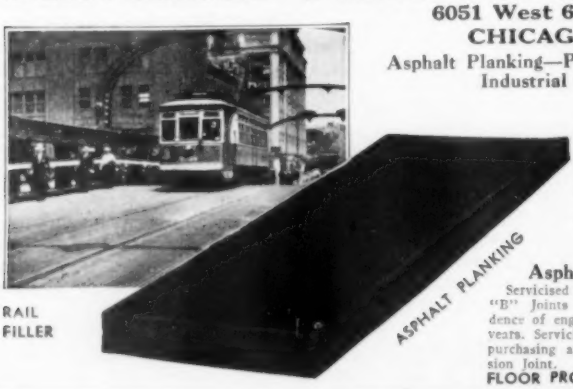
396 Platt Street Rochester, N. Y.

SERVICISED PRODUCTS CORP.

6051 West 65th Street

CHICAGO, ILL.

Asphalt Planking—Protection Course—Industrial Flooring

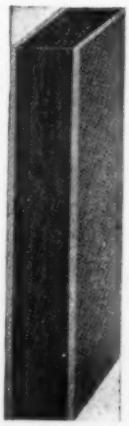


Servicised Fibrated Asphalt Plank is giving service in hundreds of first class installations. The pioneer of this line Servicised Planking has the unqualified approval of all who have used it. Write for prices today!

Servicised Asphalt Expansion Joint

Servicised Felt Sided and Type "B" Joints have enjoyed the confidence of engineers and contractors for years. Servicised service excels. When purchasing ask for Servicised Expansion Joint.

FLOOR PRODUCTS

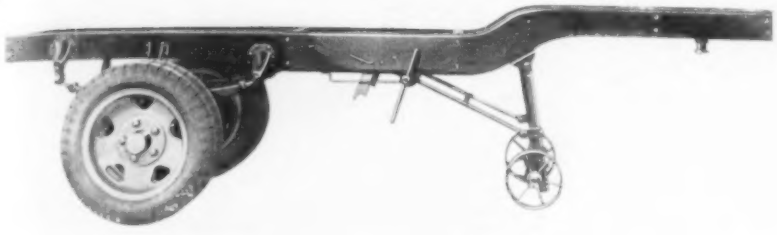


Servicised Super Rubber Joint

This sponge rubber product excels in all tests in ageing qualities and resiliency, insuring greater life. Servicised Super Rubber Joint is particularly adapted for sidewalk, curb and gutter, building work, viaducts as well as pavement. The upkeep is reduced to a minimum. Write for prices today!

Servicised Fiber Cushion Joint

Formed of wood or vegetable fiber into a boardlike structure saturated with waterproofing material—a resiliently compressible and re-expanding product.



THE GENERAL MOTORS TT-2 8 SEMI-TRAILER

A New Semi-Trailer

The General Motors Truck Co., Pontiac, Mich., has announced a new semi-trailer, Model TT-218, normal capacity 3 to 5 tons, as companion to its 1½- to 2-ton T-18 truck. The wearing parts of the truck and trailer are interchangeable. The trailer frame is pressed steel, of "fish-belly" construction, 14 feet long with 6-inch drop. Sixty per cent of the weight, including load, is concentrated on the trailer axle, making for maximum loading carrying ability. A wide margin of strength is provided by five pressed steel cross members of integral gusset type. Springs consist of eleven ⅜-inch leaves. Power brakes are of the BK vacuum type, and a parking brake can be supplied which operates automatically when lowering the support wheels. Lowering and raising the latter is accomplished by a steel cable and lever arrangement operated by a crank at the side and locked in either position by a dog. Safety is further provided by the supports swinging past the center position.

The lower fifth wheel is spring-cushioned, reducing the force of coupling blows, while the corresponding upper member consists of a heavy steel plate across the entire width of the frame, extending back to the second cross member, which supports a steel bolster and hardened king-pin. A 42-inch stake-and-rack body, or a stake express body with 2-foot reinforced tailgate, is available. Formed steel wearing strips bolted directly to steel cross sills make for dust-tight floor construction. The TT-218 semi-trailer is specially adapted for long-distance hauling.

A New Road Broom for Penetration and Maintenance Work

A new road broom which is designed particularly for gravel maintenance where the roads are subject to chatter and washboard bumps, and for oil-mix work to give greater penetration, has been announced by the Speeder Machinery Corporation, Cedar Rapids, Iowa. This new product was formerly manufactured as the Owen road broom, but now is known as the Speeder broom.

The broom is a replacement unit for the cutting edge on any standard one-man maintainer or pull-type grader and is installed by removing the moldboard and cutting edge and inserting the broom instead. These brooms vary in width from 8 to 14 feet. They are composed of steel wires about 18 or 20 inches long which give when striking an immovable object, thus eliminating any ridge. The springing action of the individual wires makes it particularly adaptable for oil penetration work.

The Speeder broom is also built as a complete unit which does not have to be placed on a grader chassis.

Moon Track Merges with Pettibone Mulliken Co.

The Moon Track Co., Chicago, Ill., has announced its merger with Pettibone Mulliken Co., 4710 W. Division Street, Chicago, Ill., steel casting manufacturers, to form an Industrial Equipment Division. R. W. Moon, Vice-President and Sales Manager of the Moon Track Co., will be Sales Manager of the new division. Associated with Mr. Moon will be G. C. Salisbury and E. C. Myers, of Milwaukee.

The Pettibone Mulliken Co. will manufacture a line of power graders. In addition to this line, the Industrial Equipment Division distributes the following nationally known items of equipment: Fabriform loaders for Case and McCormick-Deering Tractors; Atlasta trailers for trucks and tractors; Detroit street sweepers and snow brushes and Detroit mowers.

Tenth Annual Asphalt Paving Conference to Be Held in New Orleans

The Asphalt Institute, 801 Second Avenue, New York, has announced that New Orleans has been chosen for the Tenth Annual Asphalt Paving Conference, to be held in the week of November 28 or December 5, 1932. The program, in recognition of present economic conditions, will be devoted largely to phases of low-cost road construction, the major subjects for discussion including the salvaging of all pavements which are in need of resurfacing or replacement by utilizing inexpensive types; the serious economic aspects of tax diversion and tax evasion of highway revenues, and the urgent necessity of designing roads in proportion to their importance, eliminating the "over-designing" evil. The Association of Asphalt Paving Technologists will, as usual, meet in conjunction with the paving conference. William H. Kershaw, of The Texas Co., is President of The Asphalt Institute, with C. W. Bayliss, Barber Asphalt Co., B. L. Boye, Standard Oil Co. of New York, and J. A. Blood, Standard Oil Co. of California, Vice-Presidents; J. S. Helm, Standard Oil Co. of New Jersey, Chairman of Executive Committee; A. M. Maxwell, Standard Oil Co. of Ohio, Secretary.

Dickerson Manager of G. E. Lighting Section

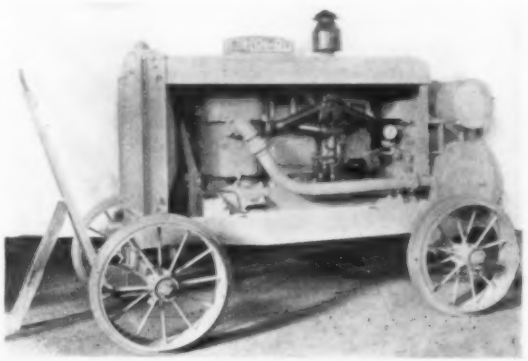
A. F. Dickerson, engineer of the Illuminating Engineering Laboratory of the General Electric Co., has been appointed manager of lighting sales and the illuminating laboratory. The activities of the present commercial lighting section in the general office and those of the illuminating engineering laboratory have been consolidated, for better coordination of selling and engineering activities. This new section will be a part of the lighting and cable division of the Central Station Department, under the supervision of F. H. Winkley, manager of that division. W. D'Arcy Ryan, formerly director of the laboratory, has been named consulting engineer of the section.

A New Line of Portable and Stationary Air-Compressors

Since 1926 the LeRoi Company, Milwaukee, Wis., has built air-compressors, and recently it has completed arrangements whereby it will not only manufacture but also market both portable and stationary air-compressors, to be known as the LeRoi-Rix line.

The stationary models are built in six sizes ranging from 100 to 600 cubic feet displacement and can be furnished powered either by LeRoi engines or by electric motors. The portable machines are powered by LeRoi engines and are built in seven sizes, ranging from 18 to 310 cubic feet displacement.

LeRoi-Rix compressors are built with the patented Rix supercharger to increase their efficiency. The LeRoi Company rates its machines not only according to displacement but also according to actual guaranteed air delivered in accordance with the best practice. An example of this is the rating of the 235-cubic-foot size, which has a displacement of 235 cubic feet of free air per minute and a guaranteed delivery rating of 203 cu. ft. of free air per minute with pressure in the receiver at 100 lbs. per sq. in.

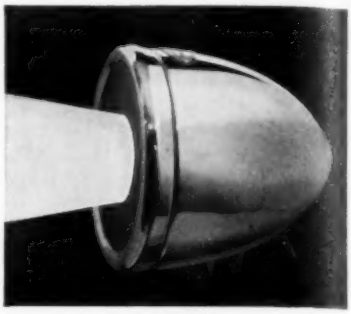


ONE OF THE LE ROY-RIX PORTABLE AIR-COMPRESSORS

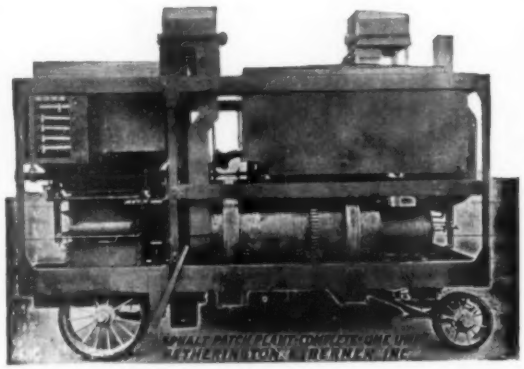
Official Identification

PATROLITE *for* POLICE CARS

When lit, signals "STOP POLICE" in RED ILLUMINATED LETTERS identifying authority of car. The command if necessary, can be readily enforced by directing the POWERFUL SEARCHLIGHT in the violator's vision, making it exceedingly difficult for him to proceed. It can be aimed by the driver in any direction while proceeding at high speed. Controlled from the steering column or instrument board. It cannot be detected from an ordinary spotlight or driving light. Cost—no greater than a good spotlight. Easily mounted by any handy-man. WRITE FOR DESCRIPTIVE LITERATURE. Salesmen's and Distributor's Territory Open.


Searchlight

PATROLITE MANUFACTURING CO. 308 LORAIN ST. BANK BLDG. CLEVELAND, OHIO



A Real Asphalt Patch Plant

A PORTABLE UNIT WITH A CAPACITY OF 400 YARDS PER DAY

ACCURATE CONTROL OF MATERIALS ASSURING ACCURATE MIXTURE TO COMPLY WITH ANY STANDARD SPECIFICATIONS

Send for Bulletin R-400

HETHERINGTON & BERNER, INC.

INDIANAPOLIS, IND.

Stationary — Railway — Portable & Semi-Portable Plants

BUFFALO SPRINGFIELD

ROLLERS

The buffalo head symbolizes strength and stamina . . two essentials of any good road roller.
When in the market think of the buffalo head . . . weigh these facts:

Oldest make of rollers. Most universally used make. Not the lowest priced, but admitted to be the most dependable and longest-lived roller money can buy.

Specify a Buffalo-Springfield in the interests of ultimate economy of purchase.

State your needs and have us suggest the type and size to conform.

THE BUFFALO-SPRINGFIELD ROLLER COMPANY
SPRINGFIELD, OHIO

Carey Elastite EXPANSION JOINT

makes *Good* Paving *Better*

The "sandwich" joint which protects concrete paving against expansion and contraction stresses. Proved by 20 years' use in highways and sidewalks in all parts of the world. Large stocks in principal cities insure immediate shipment. Write for catalog and 1932 prices.

THE PHILIP CAREY COMPANY
Department E-1 Lockland, Cincinnati, Ohio
Branches in Principal Cities

New York's Biggest Value

FINE ROOM and BATH

$2.50 SINGLE $3.00 DOUBLE

A modern, new hotel located in heart of New York, 100 feet West of Broadway yet quiet and cool. Each room has bath, circulating ice water, electric fan, Beauty-rest mattresses, exceptional furnishings and atmosphere.

Hotel Piccadilly

227 WEST 45th STREET, NEW YORK

THE RO-56 LA PLANT-CHOATE AUTOMATIC ROLL-OVER SCRAPER

A New Automatic Road Scraper

LaPlant-Choate automatic roll-over scrapers are manufactured by the La Plant Choate Manufacturing Co., Inc., Cedar Rapids, Iowa, under an exclusive license agreement with the Reynolds Estate, and are built in six sizes, 18-, 22-, 27-, 42-, 50- and 56-cubic-foot capacities, for use with Caterpillar Fifteen, Twenty-Five, Thirty-Five, Fifty and Sixty-Five tractors respectively.

These one-man automatic scrapers have a simple tripping mechanism which allows the scraper to be tripped while going forward or backward. They are equipped with a self-cleaning latch on the trip which automatically engages itself, permitting the loaded bowl to be slid backward any distance without revolving. By a single pull on the trip lever rope, the latch will disengage and permit the bowl to be rotated either backward or forward and dumped. When the load has been dumped, the latch holds the bowl in the dumping position, permitting the bottom of the bowl to be used to bulldoze the pile of earth or to spread the earth in a layer.

All sizes of these scrapers are provided with a crank to adjust the cutting depth to meet the various soil conditions, as well as with an automatic pressure release which lifts the cutting edge out of the ground when the scraper is loaded. Only one operator is required to run both the tractor and the scraper. La Plant Choate automatic roll-over scrapers are particularly adaptable for use in the construction of drainage ditches, excavations, bank widening, cleaning waterways, leveling short hauls and other dirt-moving jobs.

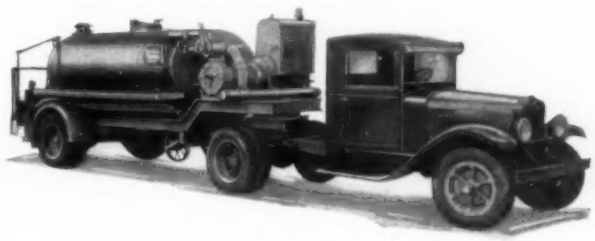
Asphalt and Oil Distributor with New Features

The Rosco bituminous distributor and oiler made by the Rosco Manufacturing Co., Minneapolis, Minn., has a number of new features, including the seven-way valve which directs the flow of material in three ways: in loading the tank; in circulating the material when idling or heating; and in taking the material from the tank to the spray bar. This valve has two suctions and two discharge openings which are controlled by one lever. The valve gear rotary pump and power plant are mounted on a semi-steel machined base immediately back of the driver's cab.

The spray bar is made up of multiple sections and is dead-ended at the center point. The outside section folds back out of the way when not in use, and is adjustable so that distribution may be obtained at various angles.

A hand spraying attachment is available for patching jobs. The hose is attached to an opening on the upper cross-pipe section of the spray bar. The flow of the material is controlled by a lever on the nozzle of this attachment.

Rosco distributors are made for either truck or trailer mounting, but because of its economical advantages, the semi-trailer unit is highly recommended. These trailer units will carry a full load with a smaller truck at a speed of 25 to 35 miles an hour and return empty at 40 to 50 miles an hour. The fifth wheel, which connects tractor and trailer, allows the unit to be turned in an unusually narrow space.



THE NEW ROSCO BITUMINOUS DISTRIBUTOR AND OILER

A Folding Bump Detector

The Rid, an aluminum folding bump detector for use on concrete roads, will show a variation of $\frac{1}{8}$-inch in a 10-foot stretch of pavement. It weighs only $20\frac{1}{2}$ pounds, is easily folded and carried from one part of the job to another. It chalks the pavement in one-third the time that is required with an ordinary straight-edge, and runs on wheels, which minimizes the wear on the machine. Whenever a high or low spot is reached, the machine buzzes electrically. The accompanying illustration shows the machine folded for easy transportation by the inspector. It is made and sold by the Cambridge Corporation, Homewood, Ill.

A New Water Regulating Valve

A group of valves especially designed for water works and hydro-electric power generation has recently been announced by the Southwark Division of the Baldwin-Southwark Corporation, Philadelphia, Pa. This line of valves has been developed to assist water-works engineers in solving some of the difficult problems met in handling water at great velocity through long pipe lines and to eliminate the dangerous pressure surges and water-hammer conditions.

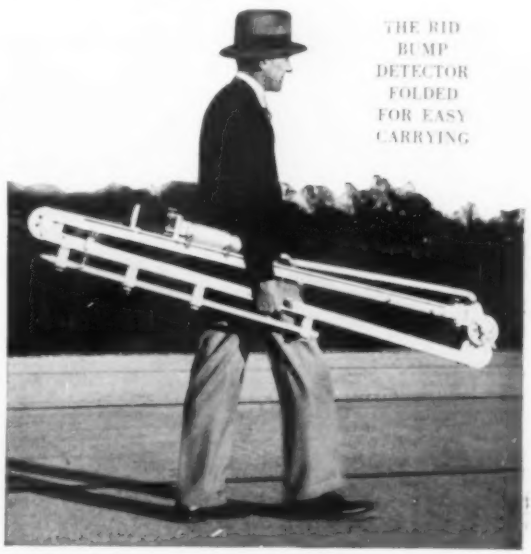
The Larner-Johnson internal-cylinder balanced-plunger principle is employed in the design of many of these valves, which include a slow-closing check valve having an adjustable rate of closure, pressure regulators which function without oscillation or "chugging," surge suppressors which involve an entirely new principle of operation, altitude valves, automatic air valves, throttling valves and automatic gate valves. This line is available in all sizes.

McWane's New Chicago Address

McWane Cast Iron Pipe Co., of Birmingham, Ala., makers of bell-and-spigot type pipe, has moved its Chicago office to Suite 1031-1032, 333 North Michigan Avenue.

Senator Pierson Becomes Municipal Consultant

Arthur N. Pierson, an outstanding state senator of New Jersey for many years, is now in private practice as a consultant in municipal finances and public affairs, at 37 Elm Street, Westfield, N. J.



THE RID BUMP DETECTOR FOLDED FOR EASY CARRYING

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Traffic Accidents Increase with Diminished Lighting, Decrease with Better Lighting

THE reciprocal relation of street lighting and traffic accidents is strikingly shown by recent experience in two widely separated cities—Detroit, Mich., and San Francisco, Calif.

Less Light, More Accidents

Hard hit by the existing depression, Detroit has curtailed municipal expenditures drastically, and street lighting is one of the activities that has suffered severely. According to L. J. Schrenk, Superintendent of the Detroit Public Lighting Commission, "Because of the city's financial condition it was necessary for the Public Lighting Commission to curtail street lighting in December, 1931, by eliminating 2,000 lamps and reducing by 30 per cent the illumination of the remainder." As stated further in the *Detroit News* for May 27, his report shows that fatal accidents, day and night, for January, February, March and April of 1932 increased 14.6, 33.3, 10.5 and 5.3 per cent, respectively, over the corresponding months of 1931; but that the increase in fatal accidents at night in these months was 40.0, 71.5, 15.4 and 27.2 per cent, respectively. In other words, these four months in 1932, with diminished street lighting, show a much greater increase in fatal night accidents than in such accidents occurring both day and night.

Similarly, the percentages of fatal accidents happening from the time the lights were turned on until midnight, as compared with the total, were larger for each of the four months in 1932 than was the case in 1931. These percentages for 1932 were: January, 46.4; February, 38.0; March, 47.4; and April, 47.4. In 1931 they were 61.6, 53.6, 58.9 and 50.0 per cent, respectively.

In 1916, according to the Commission's survey, Detroit had 200 street lights per square mile. Annexation of territory brought the average down to 141 in 1927, and an extensive lighting program was authorized to correct this condition. This program, however, was halted in 1931, by which time there were 264 lights per square mile. With curtailments in street lighting up to July 1 it is expected that the average will be reduced to 150.

Results of Adequate Lighting

An opposite situation is revealed in the case of Bayshore Boulevard, San Francisco, where a three-mile stretch of highway, 125 feet wide, was equipped in 1931 with 10,000-lumen lighting units, spaced 130 feet apart along each side of the thoroughfare, in opposite arrangement, with 20-foot mounting height.

A comparison of accident data (fatal and non-fatal) for two corresponding periods in 1931 and 1932, before and after the lighting was installed, has been made by engineers of the General Electric Co. These periods were from September 11, 1930, to May 1, 1931, and from September 11, 1931, to May 1, 1932, comprising 7 2/3 months each. In the earlier period there were 81 accidents, and in the later period 67, a decrease of 17 per cent. But the accidents occurring by day increased from 27 to 35, or 30 per cent, while those at night decreased from 54 to 32, a decline of 40 per cent. Assuming that without the lighting installation the increase of traffic would have caused night accidents to increase in the same proportion as those by day, there would have been 70 night accidents in the later 7 2/3 months. The actual number occurring under conditions of adequate lighting, 32, would then represent a decrease of 54 per cent.

Fatal traffic accidents in San Francisco as a whole in 1931, according to a report of Coroner Thos. B. W. Leland, were 104, of which 66, or 63½ per cent, were at night. Five of the night fatalities were on Van Ness Avenue, a poorly lighted main thoroughfare, which had only one day fatality. The same street had 18 fatalities in three years, 1929-1931, of which 16 were at night, or 89 per cent.

The moral is obvious.

BAYSHORE BOULEVARD, SAN FRANCISCO

A Viaduct Lighted by Units in the Balustrade

THE Western Hills Viaduct over Mill Creek valley and various railroad tracks in Cincinnati, Ohio, has a unique system of lighting, whereby the conventional type of street-lighting standard is dispensed with. The viaduct, which was constructed as part of the Union Terminal project and was placed in use early this year, was described in general and with particular reference to the traffic-control system in THE AMERICAN CITY for June, at page 79.

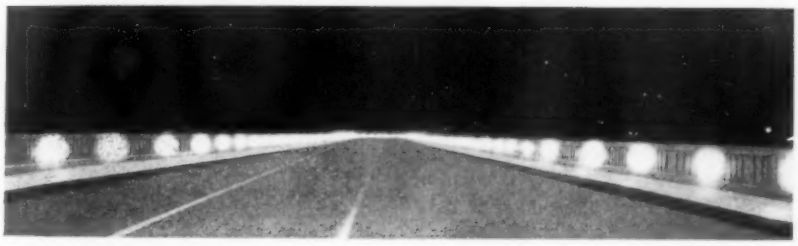
WESTERN HILLS VIADUCT, CINCINNATI, AT NIGHT

The lighting units are mounted in the balustrade, with the center of the light only two feet above the level of the sidewalk. The optical system consists of a double set of specially designed lenses giving a horizontal beam spread of 170 degrees with a very sharp cut-off of the light above the horizontal to prevent any stray light causing glare in the eyes of either pedestrians or motorists. The light is concentrated on the roadway, so as to illuminate it adequately even in rain, snow and fog, which might greatly affect the efficiency of high-mounted units. The beam carries across the viaduct to the opposite balustrate, decreasing gradually in intensity as it approaches the opposite unit, the joint effect making for uniform illumination from side to side. It is also reported that, despite the low mounting of the luminaires, troublesome shadows are not produced even by automobile traffic crossing the viaduct.

The lighting units are mounted 30 feet apart, with a total of 235 units installed on the viaduct. They are Crouse-Hinds type VCD-12, using 200-watt, PS30-bulb, 115-volt multiple lamps with profocused base. The use of this base eliminates the difficulty of refocusing the lighting unit every time it is relamped; every lamp that is placed in the unit is automatically focused for the best possible distribution.

The unit is in a metal housing with ornamental finish, $20\frac{3}{4}$ inches high, $16\frac{3}{4}$ inches wide and $11\frac{1}{4}$ inches deep, set in the balustrade, the lenses curving outward a few inches. Access is easy because of the low mounting, and maintenance is simplified.

This type of lighting is used on the upper deck and on the ramps approaching the lower decks. The lower deck is lighted by means of RLM reflectors equipped with dust-tight doors and lenses in order to simplify maintenance.



THE ROADWAY ILLUMINATED BY THE BALUSTRADE UNITS

Milwaukee's Sunken Garden Floodlighted for Night Enjoyment

By **CHARLES HAUSERMAN, Secretary, Board of Park Commissioners, Milwaukee, Wis.**

HAVING received much favorable comment upon the beauties of the sunken Garden in Mitchell Park, the Milwaukee Board of Park Commissioners conceived the idea of further spreading its fame by making it possible for the public to view it by night.

To accomplish this, six ordinary 50-foot electric light poles with four 1,000-watt lamps atop each pole, were erected and well concealed within the elm trees which surround the garden. The poles are painted green and the light so focused and refracted as to minimize glare and shadows everywhere within the entire garden, and cause a soft twilight glow to spread over every bud and petal.

The effect is enhanced by the use of Mazda C daylight blue lamps in each of the mirrored floodlights.

SUNKEN GARDEN, MITCHELL PARK, MILWAUKEE

Five Years' Progress in Baltimore's Street Lighting

THE steady development of the street-lighting system of Baltimore, Md., has continued during the last five years, including 1931, when the urge for curtailing municipal expenditures became particularly insistent. In 1927 a gross addition of 1,476 lamps was made, and in each of the four succeeding years approximately one thousand were added. Improvements in type, intensity and distribution of existing lamps has also proceeded on a substantial scale.

A Pioneering City

Baltimore was the first city in America to have a gas street-lighting system, which was established in 1817; its use of electricity for this purpose began experimentally in 1881, only two years after the first public installation in the country, and in 1882 received official recognition by contract. Gas lighting has long held its own in the city, and on December 31, 1927, there were more gas than electric lamps, the figures being: gas, 17,188; electric, 16,851; total, 34,039. In the next year the situation became reversed; and on December 31, 1931, four years later, there were 21,110 electric lamps, as against 17,304 gas lamps, a total of 38,414.

In the recently issued quadrennial report for the period from May, 1927, to May, 1931, prepared by William F. Broening, Mayor for that period, street-lighting progress was reviewed by Warren Viessman, Mechanical-Electrical Engineer at that time, as follows:

"During this period the Lighting Division was enabled to accomplish a number of important projects, resulting in increased efficiency in street lighting and effecting economy in maintenance. The electric lamps situated on various bridges of the city were turned over to a private contractor, under an existing contract; at contractor's expense a new type Novalux fixture replaced the old type inefficient lamp. These new fixtures become the property of the city at the expiration of this contract. This change in the type and maintenance of the bridge lamps not only increased the illumination at dangerous locations throughout the city but effected a saving to the city of approximately $5,000 per annum. . . .

"In an effort to increase the efficiency and candlepower of the electric lighting system, this division has been gradually eliminating the old type more or less antiquated magnetite arc lamps; and now the last of these lamps have been removed. This arc lamp has been replaced with an incandescent Novalux lamp and 3,000 replacements have been made without cost to the city. A more efficient distribution of light results, as these lamps are operated at lower cost to our contractors. This reduction in cost was passed on to the city in the new contract effective November 1, 1928. It amounts to approximately $37,000.

"A number of improvements were made in the street lighting system. Old type gas and electric lamps with new Novalux incandescent lamps were mounted on small and large ornamental posts, continuing the policy of the Bureau by extension of superior lighting facilities to various thoroughfares, which, by reason of increased vehicular traffic, widening and paving, had been inadequately illuminated by gas or electric lamps mounted on brackets fastened to wooden poles.

"The continued policy of the city widening the several main traffic arteries leading from the city afforded an opportunity to install on these new boulevards a permanent ornamental electric lighting system with cables in underground conduits. The unsightly wooden poles and overhead wires thus eliminated made these main thoroughfares more pleasing to the eye by day and night.

Better Street Appearance

"Over 2,000 lamps were added to the white way system of Baltimore during the present administration, improving day-time appearance of thoroughfares by replacement of old style wooden poles having gooseneck arc lamps with large ornamental iron or concrete granite finished standards.

"The longest and most continuous white way system in Baltimore is on Belair Road from North Avenue to the new city line. This thoroughfare formerly had 103 lamps, with an aggregate of 30,850 cp. After the change-over it had 178 lamps, with a total of 106,800 cp., a net increase of 75,950 cp., nearly 3.5 times the value of the previous illumination. Since 1926 the number of street lamps has been increased by 4,300, or 13 per cent, while the candlepower has increased by 950,000 or 18 per cent."

In the early part of the administration of Mayor Howard W. Jackson, the present chief executive of the city, the street-lighting system continued to grow, but new lamp installations gradually became fewer with the inauguration of an economy program on July 1. John J. Hanson, Lamps and Lighting Superintendent, states in his report for 1931 that 970 new lamps were installed during the year, mainly due to an uncompleted paving program for the previous year. Of this number 949 were electric and 21 were gas. Many old-style one-burner gas lamps were also replaced by the modern two-burner type, thereby providing over 100 per cent additional illumination at an increased cost of about 30 per cent.

The economy program referred to has not resulted in any drastic cutting down in street illumination, such as some other cities have unfortunately seen fit to adopt. According to W. Rayner Straus, the present Mechanical-Electrical Engineer, there has been no elimination of street lamps whatsoever, but some reduction in lighting intensity has occurred on minor streets and alleys where 6,000-lumen incandescent lamps were installed within the last few years under a blanket order to replace all old arc lamps with this type, without a study of relative illumination requirements.

BALTIMORE STREET-LIGHTING SYSTEM
January 1, 1932

Type	Candlepower	Number	Annual Cost
ELECTRIC LAMPS			
Owned and operated by Consolidated Gas, Electric Light & Power Co.:			
S, OH	60	6,762	$26 75
S, OH	250	1,474	44 25
S, OH	400	998	58 75
S, OH	600	394	67 00
S, UG	60	778	45 88
S, UG	250	149	63 38
S, UG	400	779	77 88
S, UG	600	1,031	86 13
M, Com	62	2,500	36 13
M, Com	320	43	56 63
M, Com	490	19	73 13
City owns poles, company owns fixtures and cable:			
S, Cond	100	64	43 00
S, Cond	100	134	47 38
S, Grd	100	242	36 67
S, Grd	100	1,151	35 00
S, Grd	250	44	43 67
S, Grd	250	113	42 00
S, Cond	250	63	53 00
S, Cond	250	86	54 38
S, Cond	400	73	61 78
S, Grd	400	93	49 00
S, Cond	600	1,217	71 38
S, Grd	600	129	59 00
M, Com	1,000	3	90 00
S, Cond	1,000	61	104 00
S, Cond	1,500	1,334	114 00
City owns poles and fixtures, company owns cable:			
S, Cond	600	126	70 00
City owns poles, fixtures, cable, etc., and furnishes current, American Street Lighting Co. furnishes operation and maintenance: (Cost given includes current)			
M, Cond	60w.	10	8 30
M, Cond	100w.	288	16 75
M, Cond	200w.	8	25 30
M, Cond	300w.	55	27 55
S, Cond	100	777	17 45
S, Cond	250	19	25 25
S, Cond	400	4	34 10
S, Cond	600	86	65 02
GAS LAMPS			
City owns poles and furnishes gas and service connections; American Street Lighting Co. furnishes fixtures and maintenance: (Cost given includes gas)			
Ornamental	35	1,328	26 53
5-light	35	20	26 53
Boulevard	55	13,795	24 85
2-burner	110	2,161	37 03

S, series; M, multiple; OH, overhead; UG, underground; Com., combination; Cond., in conduit, Grd., in ground; w., watts.

Appropriation for 1932	$1,545,809 44
Average cost per lamp	40 25
Cost per capita	1 86

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The American City

Are your municipality, county and state preparing to ask for and use their share of the vast Federal funds now available under the new Emergency Relief and Construction Act?
See pages 5 and 80-83 of this issue

This Well-Lighted Concrete Bridge Crosses the Parkway That Lies Opposite the New Municipal Building in Glen Ridge, N. J., Shown Above

See pages 51 and 52